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ABSTRACT

The educational potential accessible with the aid of international communications networks and computer-mediated communication was explored with Finnish secondary school students in an ethnographic study that also investigated gender differences and quality of education. Subjects were 108 students (46 males and 62 females) from six classes in three senior secondary schools with four teachers of English. Girls provided slightly more analytical comments than did boys, and more females than males appeared ready to commit themselves to a new kind of learning environment. Results suggest that when computer-mediated communication is introduced, attention should be paid to what each sex masters best in computing. Male interest in hardware could be fruitfully combined with girls' skills in word processing and their ability to exchange ideas in writing. Both sexes should have access to computing resources in their schools with electronic mail (e-mail) as a tool. An important finding is that males and females can enjoy working in a learning environment focused on computer-mediated communication. They can become deeply committed to working in an e-mail equipped cooperative and collaborative learning environment and can learn from each other and from interacting with the computer. Six charts present study findings, and four appendixes contain the two student questionnaires and their English translations. (Contains 108 references.) (SLD)

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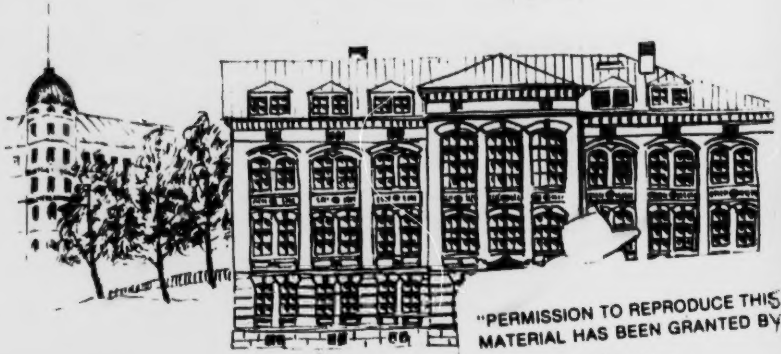
RESEARCH REPORT 110

Department of Teacher Education
University of Helsinki

Seppo Tella

BOYS, GIRLS, AND E-MAIL:
A Case Study in Finnish Senior Secondary Schools



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RESEARCH REPORT 110

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Seppo Tella

Boys, Girls, and E-Mail: A Case Study in Finnish Senior Secondary Schools.
(100 + 13 pages)

Abstract

The purpose was to explore the educational potential accessible with the aid of international communications networks and computer-mediated communication mainly as seen by the participating Finnish students. This was associated with students' attitudes and preferences to teaching practices and teaching tools. A more general purpose was to examine gender sensitivity of e-mail and the question of equality education.

The research method was based on an ethnographic approach complemented by a symbolic interactionist perspective, the constructivist view of knowledge, and an anthropomorphic model. Perry's Map of Cognitive and Ethical Development and the Social Factors Model were also utilised.

The research problems included computer equity/inequity, equality education, opinions and preferences between boys and girls concerning the use of communications networks and e-mail, achievability of aims and goals, student generated disturbances, and students' initiative. The Finnish participants consisted of six classes (Form 1 or 2) in three senior secondary schools, with four teachers of English (mother tongue: Finnish). Data was gathered during fieldwork (Nov. 1989—May 1990).

The girls provided slightly more analytical comments than the boys. When expressing a critical opinion, many girls motivated their views while the boys often contented themselves with blunt statements. More girls than boys appeared to be ready to commit themselves to a new kind of learning environment.

When computer-mediated communication is introduced, attention has to be paid to what boys and girls best master in computing; boys' interest in hardware could be fruitfully combined with girls' skills to manipulate the word-processors and their ability to exchange ideas in writing. Both boys and girls should have more direct access to the computing resources of their schools and e-mail as a tool. E-mail increases the use of computers as tools. It can also have a democratising influence on power relationships in class, by giving new opportunities to shy or slow students. Computer-mediated communication and e-mail need be understood as a useful form of activity which helps students in their studying and which will replace part of traditional teaching and will gradually become a relevant part of the teaching/learning process. One of the most important conclusions was that both boys and girls could enjoy working in a learning environment focused on computer-mediated communication; they could become deeply committed to working in an e-mail-equipped co-operative and collaborative environment and learn not only from each other but also learn from and interact productively with the computer.

Keywords: Computer Inequity, Equality Education, Gender Sensitivity, Electronic mail, Communications Networks, Computer-Mediated Communication, Foreign Language Teaching, Attitudes, Senior Secondary School

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Seppo Tella
Boys, Girls, and E-Mail: A Case Study in Finnish Senior Secondary Schools.
(Tytöt, pojat ja sähköposti) (100 + 13 sivua)

Tiivistelmä

Tavoitteena oli tutkia kansainvälisiin viestintäverkkoihin ja tietokonevälitteiseen viestintään sisältyviä kasvatuksellisia mahdollisuuksia erityisesti suomalaisten lukiolaisten näkökulmasta sekä heidän asenteitaan ja mieltymyksiään opetuskäytänteisiin ja -välineisiin. Erityistavoitteena oli tutkia sähköpostia tyttöjen ja poikien näkökulmasta sekä kysymystä tasa-arvokasvatuksesta.

Tutkimusmenetelmänä oli etnografinen lähestymistapa, jota täydensivät symbolinen interaktionistinen näkökulma, konstruktivistinen tiedonkäsitys ja antropomorfinen malli. Lisäksi käytettiin kognitiivisen ja eettisen kehityksen mallia sekä sosiaalisten tekijöiden mallia.

Tutkimusongelmat käsittelivät tietokonetasa-arvoa, tasa-arvokasvatusta, eri sukupuolten mielipiteitä ja mieltymyksiä viestintäverkkojen ja sähköpostin käyttöön, tavoitteiden saavutettavuutta, oppilaslähtöisiä häiriöitä ja oppilaiden aloitteellisuutta. Suomessa tutkimukseen osallistui kolmen lukion neljän englanninopettajan (äidinkieli: suomi) kuusi 1. tai 2. luokkaa. Analysoitu data kerättiin kenttätutkimuksen aikana (marraskuu 1989 – toukokuu 1990).

Tyttöjen kommentit olivat hieman analyyttisempia kuin poikien. Ilmaistessaan kriittisen mielipiteen monet tytöt perustelivat näkemyksiään, kun taas pojat tyytyivät usein irrallisiin tokaisuihin. Useammat tytöt kuin pojat vaikuttivat valmiilta sitoutumaan uudentyyppiseen oppimisympäristöön.

Kun tietokonevälitteistä viestintää otetaan käyttöön, huomiota on kiinnitettävä kummankin sukupuolen parhaiten hallitsemiin tietokoneiden käyttöalueisiin. Poikien kiinnostus laitetekniikkaan voitaisiin yhdistää hedelmällisesti tyttöjen teksturinkäyttötaitoon ja heidän kirjoittamistaitoihinsa. Sekä tyttöjen että poikien tulisi saada käyttää nykyistä enemmän koulujensa tietokonelaitteita ja sähköpostia työvälineenä. Sähköposti lisää tietokoneiden työvälinekäyttöä. Se voi vaikuttaa luokan valtasuhteisiin demokratisoivasti antamalla uusia mahdollisuuksia ujoille tai hitaille oppilaille. Tietokonevälitteinen viestintä ja sähköposti on ymmärrettävä hyödykkääksi toimintamuodoksi, joka auttaa oppilaita heidän opiskelussaan ja joka korvaa osan perinteista opetusta ja josta muodostuu vähitellen keskeinen osa opetus–opiskelu-prosessia. Yksi tärkeimmistä johtopäätöksistä oli, että sekä tytöt että pojat saattoivat työskennellä mielellään tietokonevälitteiseen viestintään keskittyvässä oppimisympäristössä. He kykenivät hyvin työskentelemään sähköpostia käyttävässä yhteistoiminnallisessa ympäristössä ja oppimaan ei vain toisiltaan vaan myös tietokonetyöskentelystä ja olemaan lisäksi tuottavassa vuorovaikutuksessa sen kanssa.

Avainsanat: tietokonetasa-arvo, tasa-arvokasvatus, sukupuolten väliset erot, sähköposti, viestintäverkot, tietokonevälitteinen viestintä, vieraskielen opetus, asenteet, lukio

Acknowledgements

The present report is the third part of a research project, initiated in 1989, on foreign language (FL) education and some pedagogical applications of Information Technologies (IT). It forms a continuation to the first and second parts (Tella 1991; Tella 1992a).

During the past three years, I have benefited greatly from discussions with many of my colleagues at the University of Helsinki Department of Teacher Education and at the University of Helsinki Department of Education. I am most grateful to all of them for sharing their views with me.

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Helsinki,
August 11th, 1992.

Seppo Tella

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1. Introduction

This report is the third part of a research project, initiated in 1989, on foreign language (FL) education and computer-mediated communication as a pedagogical application of Information Technologies (IT).

In the first part (Tella 1991) it was reported how an open, multimedia-based learning environment was created through international electronic links between several Finnish and foreign schools and how international communications networks and electronic mail as a technological innovation were introduced into and adapted for the teaching of English as a foreign language in Finnish senior secondary schools.

The second report (Tella 1992a) continued to explicate the implications of the innovation/adoption process started in the fieldwork period of the research project. It also analysed the character of computer-mediated communication on international communications networks and the use of electronic mail in the teaching of English as students' first foreign language in some Finnish senior secondary schools. The second report focused on contents, themes, and topics, discussed *vis-à-vis* the current foreign language curriculum (Anon. 1985) implemented in Finnish senior secondary schools. Another linguistic purpose was to analyse the way the target language was used in e-mail communication between Finnish and foreign partner schools at various levels (teachers, students).

The scientific problem of the first two reports was built on communicativeness as a general objective in foreign language teaching and communications networks contributing to communicativeness in foreign language classrooms. The concept of communicativeness was used to refer closely to readiness and willingness to exchange information. Also, the multidirectional character of e-mail communication, as compared to more traditional ways of dealing with language materials, was emphasised, as well as the degree of initiative and free negotiable topic choice among the participating students.

Briefly, at the first stage of the research project, and in the first report, international communications networks and electronic mail were launched as technological innovations into foreign language classrooms. At the second stage (in the second report), their introduction was already considered a *fait accompli.*

This part of the research project will mainly deal with the issue of gender sensitivity and the Finnish students' views, opinions, and preferences concerning the use of e-mail in the teaching of English. This perspective is motivated by several facts. First, the relative novelty of e-mail in foreign language education needs further assessment. Second, the main focus has so far been on pedagogical applications of Information Technologies, examining whether they can be utilised in foreign language education, and then on teaching practices and subject matter. It has also been analysed how the use of the target language was changed through the use of international communications networks. Third, more focus has been laid on the teacher than on the students themselves, although their contributions and opinions have been quoted in earlier reports. The students' points of view will be focused upon next. As the students will soon be grown-up members of an information society, it is worth while analysing their views on how e-mail and foreign language education can best be combined. This is in harmony with the new type of knowledge lately characterised as dynamic but transient (cf. e.g., Chisholm 1989; Lehtinen & al. 1989; Lehtinen 1990; Leino 1989; Olson & Atkins 1990; Rice & Shook 1990; Voutilainen, Mehtäläinen & Niiniluoto 1990; Välijärvi 1990). In the world of these students, Komoski's prophecy of technology and the organisation and transfer of information becoming increasingly synonymous (Komoski 1987, 22) will probably come true. Besides, everybody can be expected to need adequate understanding of computer functions and to have a fair command of computer literacy as citizens of an information age. Toffler (1981) has referred to this as one component of his *tri-literacy* (cf. also Tella 1991, 16).

This kind of analysis is further motivated by the future developments in the Finnish school context concerning the renovation of curricula and the position of Information Technology as an independent school subject. According to a recent memorandum (Anon. 1992), if accepted and implemented, Information Technology, starting from 1994, will no longer be taught as an autonomous school subject. Rather, the main contents of IT will be incorporated into the teaching of various subjects, such as foreign languages. This would obviously mean that teachers of respective school subjects are expected to master the school applications of IT better and more profoundly than earlier. On the resources' level, this would also mean that the computer laboratories, so far mostly allocated to the teaching of IT, will be open to other school subjects.

The specific purpose of this third research report is to explore the educational potential accessible with the aid of international communications networks and computer-mediated communication as seen by the participating students in particular. Thus student-based factors will be analysed in the implementation of a technological innovation. At a higher level, this is associated with students' attitudes towards their studies and their preferences to teacing practices, teaching methods, and teaching tools.

A more general purpose is to examine how gender sensitive the use of e-mail might be. This issue is closely linked to the question of equality education as well.

Both questions will be analysed in instructional contexts, created during the fieldwork period of the present research project, which provided full face-to-face contact among the students in their own classrooms but only limited contact with foreign partner school students (only via e-mail or by ordinary post).

2. Gender and Information Technology

2.1. General

The main idea in this theoretical part is to explicate a number of factors associated with foreign language education and the differences between boys and girls. As this is an extremely large area, which also concerns general didactics and pedagogy, only a limited number of issues will be considered and discussed in the present text, mainly the issues of equity/inequity and equality education. This is connected to gender expectations which may well reflect upon the ways computers and e-mail are being used in FL classrooms.

It is a current belief that girls tend to learn foreign languages more easily and without as much ado as boys. Boys also tend to opt out foreign languages more often than girls do if they have a choice. This was seen in Finland in the 1970s when three different sets (streams) were used in the teaching of the first foreign language at the Finnish comprehensive school level. Boys generally chose lower sets than girls and more boys were shifted from higher sets to lower ones on account of their poor performance. The sets were finally done away with as pupils of the lowest set could not go on to senior secondary schools because of the legislation.

At the senior secondary school level, the differences in foreign language competence and performance between boys and girls become less significant, and, as a curious example, boys tend to do quite well in the National Matriculation Examination at the end of their third year (roughly at the age of 18).

It is also generally believed that most of the contents of FL teaching favours girls, while topics preferred by boys are scarce. From this point of view, it is interesting to study whether the introduction of computers and e-mail can change this situation. It might be hypothesised that computers appeal to boys somewhat more, but once girls realise the potentialities hidden in word-processing tools in particular, they quickly start making the most of them and the possible differences disappear.

2.2. Aspects of Equality Education

As general education is based on principles of equal rights as far as boys and girls are concerned, the question arises whether equality or equity is dominant in FL classes as well. The question basically is about whether both boys' and girls' interests, tendencies, and preferences are adequately taken into account in FL education. Undeniably, issues of sex, gender and even sexuality are omnipresent in education systems, as many researchers have argued (cf. e.g., Delamont 1990). In the following, some aspects, mainly gathered from research literature, will be pointed out, with special reference to computing, computer-assisted learning, and computer-mediated communication, when appropriate.

Equality education is not the only term one could use. Other terms used in various countries are, for instance, *girl pedagogy* or *girl friendly schooling* (used in England). In Denmark one speaks of *pigepedagogik* instead of equality education. In general, in pedagogies taking into special consideration girls' starting-points there are several features common to other new pedagogical approaches (Steiner; Montessori; holistic education):

—learning starts from problems and experiences
—the teacher is preferably a consultant, not a knowledge/information transmitter
—strict limits between different school subjects and lessons are given up
—text books are less important; what counts more is the role of independent information retrieval
—increased significance of learning outside class and school.
(Haataja, Lahelma & Saarnivaara 1989, 40)

Several steps developed expressly from girls' starting-points have proved beneficial to boys as well. These are considered to support quiet and non-committal boys in particular, and boys interested in matters traditionally regarded as those of girls. These kinds of boys often pass in school as unnoticed as quiet girls. Their situation is in many respects worse as they do not follow the stereotypic model of other boys. (Haataja, Lahelma & Saarnivaara 1989, 40)

This problem naturally includes many socioemotional factors, i.a. motivation. Riding (1984) has studied the dependence of motivation on the scale extrovert–introvert. He holds that an extrovert learner probably needs more stimuli and arousing interest than an introvert to get to his[1] optimum level of performance. An extrovert profits from bright colours, sounds, from a continual change in learning environment, rich feedback, etc. An introvert, on the other hand, profits from fewer stimuli, from tender colours, from a quieter, often also more individualistic learning environment, nor does he need continuous feedback or changing learning situations. An introvert's level of performance is lowered if the environment changes or it is made too stimulating. Extrovert learners are often verbalisers; information is represented in them in word associations, while introverts have more mental images. Many learners are in the middle of this scale so that each of them has an individual optimum level of stimuli. (Riding 1984) Even if the dimension extrovert–introvert is arguable to some extent, the environment of stimuli appropriate for learners should be taken into account. It is to be believed that a computer-mediated communication environment affects different learners in different ways, whether they are working in dyads or in small groups.

It has been suggested by Travers (1978, 267) that extrovert teachers may cope better with drill methods than with other teaching methods; as to introverts, the situation is the other way round. Travers' argument would easily lead to a conclusion that extrovert teachers in fact stick to drill type teaching and thus slow down the development of software. This is particularly relevant from the point of view of foreign language teaching, because courseware has earlier represented a methodically old-fashioned view. Drill and practice is the easiest kind of software to program. However, foreign language education has surpassed the phase of mechanical drills. Making use of communications networks in teaching is far from using drill and practice –type activities. Communications networks provide an explicit gateway out of classrooms, in the direction of outside society and abroad.

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[1] The male pronoun 'he' is used in this report in its purely generic sense to apply to both male and female. This way certain tortuous constructions like 'his/her' or 'him/her' can be avoided.

One of the central concepts in this report is *gender*, often confused with *sex*. The distinction between these two will be based on Delamont's (1990, 7) definition. Briefly, as *sex* properly refers to the biological aspects of male and female existence, talking about sex differences should therefore refer to physiology, anatomy, genetics, hormones, etc. *Gender*, when properly used, should refer to all the non-biological aspects of differences between males and females: clothes, interests, attitudes, behaviours and aptitudes, for example, which separate 'masculine' from 'feminine' life styles. Delamont (1990) therefore argues that we should not talk of sex roles, as the roles people play in society are essentially related not to biology, but to social behaviour; that is, they should really be called gender roles. On the whole, gender seems to be socially created, because every culture discovered across the world has such different norms for 'masculinity' and 'femininity'. (Delamont 1990, 8) Lahelm (1992, 7) points out that gender is based on biological sex but that it is determined in a number of ways in different communities and societies.

The idea of gender being socially created also implies that it consists of several interacting levels even within the school context (cf. e.g., Sutherland 1992). It may include the level of teaching materials and computer software but also, the level of teachers vs. students, but also the target language / native language level. The language includes an enormous number of instances of gender, but this aspect will not be focused upon in this report. Sutherland (1992, 81) refers to *gender* to mean culturally– (though not deterministically–) influenced characteristics of each sex, while *sex* means whether a person is biologically female or male. A certain degree of gender insensitiveness may result from course content if it emphasises, neglects, devalues, or misrepresents experiences, concerns, and/or perspectives typically associated with one sex (Sadker & Sadker 1984).

Two terms frequently used in this connection are *equity* and *equality*. In general parlance, *equity* refers to fairness or right judgement, whereas *equality* refers to the sameness in size, amount, number, degree, value, etc. In educational parlance as well, they are kept apart and not regarded as synonyms. Sutton (1991), for instance, basing her definition on Secada (1989), refers to equity as a qualitative property, referring to judgements regarding justice, while equality is considered a quantitative property describing parity among groups along some index (e.g., access to computers, attitudes towards computers). *Computer inequity* is defined by Anderson, Welch & Harris (1984; cited by King 1987, 12) as unequal access to computer learning as consequences of students' social and economic positions. In King's view (1987), *computer equity* is broader than mere access to computers and must account for *how* computers are used when implementing the curriculum. Equity is concerned with identifying which students have opportunities for learning *about* computers (i.e., gaining literacy and programming skills) as well as *with* computers (i.e., using them as tools for learning and problem solving). Issues connected to equity/inequity become important as soon as students, their parents, and teachers realise what sort of educational and economic benefits there are for those students who master the capabilities of computers. (King 1987, 12)

The issue of equality also means equality of opportunities in terms of students' interests and language needs, which implies a close correlation with the curriculum to be implemented. Wheldall, Merrett & Houghton (1989) phrase this requirement as follows:

> "(...) most of what pupils do in school should appeal, should be exciting and should have obvious value for them, even if not in the immediate future. If the curriculum they are led to follow is without some excitement, some challenge, some enjoyment and if it does not aim eventually at the pupils' ultimate and lasting good, it cannot be called educational and has no place in the school or the classroom. Her Majesty's Inspectorate have called attention more than once to the importance of matching the content of the curriculum to the needs of pupils. If we are serious about equality of opportunity we must recognise the need for a curriculum appropriate for all our pupils whatever their cultural or social background." (Wheldall, Merrett & Houghton 1989, 39)

2.3. Selected Research Findings

In the following, a number of research reports will be analysed, in order to locate research findings on possible differences in attitudes or outcomes between boys and girls concerning the use of Information Technologies. Quite a number of articles deal with computers and girls, often starting from the viewpoint that computers may disadvantage girls. Hattie & Fitzgerald (1987) caution against these views becoming axiomatic, as opinions of these kinds may lead to negative attitudes on the part of girls and make them avoid Information Technology as such. Clarke (1990), for instance, integrates an array of often fragmented writings, according to which sex differences favour males in overall computer use, course enrolments, programming and games, but there are few sex differences in the use of computer applications. Explanations focus on sex-based differences in expected outcomes. These expectations arise from cultural beliefs about competence, differences in the outcomes of computer experience, often associating computing with mathematics, technology and maleness, attitudes of parents and teachers, and preferences for sex segregation. On the whole, experience with computers is expected to be beneficial and lack of such experience puts one in a disadvantaged position. Clarke further points out that there are marked sex differences favouring males in computer use both at home and at school, as well as in the use of computers for programming and games. However, sex differences are less clear in the use of general computer applications (e.g., word-processing, data analysis). In a US-based survey, for instance, it was reported that 36 % of the children at primary level who were using computers as word-processors were girls, with this proportion increasing to 40 % at middle school and 60 % at high school. (Clarke 1990, 52—55)

Clarke (1990) further concludes that as far as sex-based differences in expected outcomes are concerned, they develop through (a) cultural beliefs that girls are less competent at computing than boys, (b) sex-based differences in the outcomes of computer experience, (c) associations of computing with mathematics, technology and maleness, (d) sex-based differences in the attitudes and behaviours of parents and teachers, and (e) preferences for sex segregation. Clarke denies the myth that boys would have some innate capacity for working with computers which is somehow absent in girls, as there is little evidence to suggest there are sex-based differences in any type of 'computing ability'. Once girls participate in computing classes, they perform equally well as their male counterparts, so what counts more than a concern with sex differences in ability is the question of why girls not only gain less experience of computing but also profit from it less than boys. (Clarke 1990, 57) Not all researchers agree, though. Terlon (1990, 53), for example, argues that sex appears to be the most explanatory variable among all variables affecting students' attitudes. However, Terlon's (1990, 53) findings about boys' attitudes being more positive than girls' are in harmony with those of Hattie & Fitzgerald (1987), who concluded that girls' attitudes change in a slightly negative direction as they grow up.

One explanation may lie in the way boys and girls interpret their failures or successes. Linn (1985; cited in Clarke 1990, 58) is probably right in arguing that at both primary and secondary level, boys generally attribute their failures to a lack of appropriate strategies, while girls attribute them to their own lack of competence or the difficulty of the task. Boys attribute their successes to their good strategies; girls attribute them to luck. Linn's conclusion refers to different strategies of interpreting personal experience. Clarke (1990) concludes that these differences in attributional processes make boys develop more positive attitudes, rating themselves as more skilled than girls do with comparable levels of achievement. Girls' strategies are reproductive, relying on memory, whereas boys use constructive strategies, more dependent on understanding. (Clarke 1990, 58) This may also explain the fact that boys tend to be more active in experimenting with various solutions on the computer, while girls want to have something done, on their own or in co-operation with other girls or with the teacher.

In connection with computer-mediated communication and the use of e-mail, this may lead to a conclusion that boys might be more willing to experiment on how the e-mail system really works, how they can log on to various computer conferences or what kind of measures they have to take in order to be able to operate the whole system. Girls, on the other hand, could be expected to act in a more business-like manner, tackling the job of letter exchange, for instance, with a keener eye, attempting to get going as soon as possible (cf. also Gribbin 1987).

This may, however, be contradictory in terms of students' choice of a future job. In that respect, boys are often attributed the *rationality of goal directnedness* (Sørensen 1982), which makes them stress income and power in their future jobs, while girls are attributed the *rationality of caring* (cf. Skog 1991). Perhaps the girls' rationality of caring lends itself more easily to paired work at the keyboard. In addition, students' prospects of their future jobs may have a direct bearing on their attitudes while still at school. It could be assumed that more boys than girls aim at having a technological career, in which computing skills would be highly appreciated. This, of course, will not hold any more because in an information society, more than 50 % of its active population will work in jobs more or less closely connected to Information Technologies. In this respect there is an interesting difference between certain studies carried out in Anglo-Saxon countries when compared to a multinational study carried out by Terlon (1990). Terlon (1990) concludes that the traditional division of jobs and careers into feminine and masculine ones is no longer maintained by the students themselves:

> "[Les garçons] sont aussi nombreux que [les jeunes filles] à exprimer qu'«il n'y a plus de métiers masculins ou féminins», que les filles sont aussi capables d'avoir des métiers techniques, etc. même si ces garçons, essayant de se projeter dans l'avenir, décrivent pour eux-mêmes des occupations professionnelles et une vie familiale très «traditionnelle» (femme au foyer pour s'occuper des enfants). (...) Même si elles manifestent un moindre intérêt pour la technologie qu'elles perçoivent de façon moindre positive et moins précise que les garçons, comme l'enquête internationale l'établit de façon statistiquement significative pour tous les pays concernés, les filles affirment avec ensemble leur conviction qu'elles sont aussi capables que les garçons, qu'elles sont aussi habiles, qu'elles peuvent avoir les mêmes métiers qu'eux. Cependant il est intéressant de remarquer que cette prise de position pour elles-mêmes en tant que groupe n'entraîne pas la même affirmation de soi en termes personnels." Terlon (1990, 57)

As to the system of rules governing speaking, listening, and turn taking in class (the so-called *participation structure*; Doyle 1986, 402—404), boys and girls differ from each other. On the whole, boys often enjoy working alone, while the majority of the girls prefer activities involving social interaction (e.g. Maccoby & Jacklin 1974; cited in Clarke 1990, 58—59; cf. also Terry 1987). Clarke (1990) has gathered several studies which show that at secondary level, the participation of girls in computing activities has increased when classroom organisation has encouraged paired work or group work (Macrae 1985; Sanders 1985). Although the ethos in a computer lab has dominantly been more male than female, the new applications of Information Technologies, such as computer-mediated communication and e-mail, can lay more emphasis on aspects that may have an influence on the atmosphere.

An interesting finding was made by Clarke (1985), according to which girls in a single-sex school stereotyped computing as a female activity, whereas in a coeducational school both boys and girls tended to sex-type it as male. In Clarke's study, these stereotypical perceptions were reflected in attitudinal and achievement differences as well. As Finnish senior secondary schools are coeducational, this kind of prior hypothesis is only of academic interest.

When gender differences are being discussed, it must be borne in mind, as Delamont (1990, 2) has put it bluntly, that naturally schools do not create sex stereotyping against the trend of the wider society; they rather reflect the society in which they are embedded. There are several ways in which schools differentiate between boys and girls to the disadvantage of both sexes, viz. the organisation of the school; teachers' strategies for controlling and motivating pupils; the organisation and content of lessons; the informal conversations between pupils and their teachers; and leaving unchallenged the pupils' own stereotyping and self-segregating of activities. (Delamont 1990, 3) Not all researchers (e.g., Forsyth & Lancy 1989, 51), however, have found significant gender differences in either attitudes or achievement resulting from a computer learning experience with a particular kind of software program. In addition, we have to bear in mind that also students themselves can be rather conservative in their attitudes, so that the picture as described by Delamont (1990) is not that simple. Schools are being influenced by the surrounding society, and vice versa.

Why, then, do boys and girls develop different attitudes towards the use of computers? Forsyth & Lancy (1989, 52) suggest the ways in which children are first introduced to computers may foster gender differences. Often the first encounter is through a video game, and video arcades are overwhelmingly dominated by males. In addition, boys tend to play with home video or computer games more often than girls. Sanders (1985; cited by Forsyth & Lancy 1989, 52) showed that media (television ads, computer magazines, etc.) consistently portray computers as male-oriented. In Finland, it has been noticed that computer clubs usually consist of boys and the few girls that aim at joining the club often find it almost impossible to make themselves accepted wholeheartedly (cf. e.g., Meisalo & Tella 1988, 57). As most of the computer club animators are male teachers, it is also up to them to create an atmosphere which would encourage girls to enter the club. Wood & Lenze (1991, 16) caution against gender insensitivity, i.e., recurrent instances of devaluing, trivialising, and negative stereotyping which may create an environment not conducive to girls' intellectual and personal development.

A point to be borne in mind is concerned with the position of teachers towards their students in general. As foreign language teachers start operating in computer-equipped rooms, I wonder whether patterns of their "typical" behaviour will change in that process. On the whole, one could ask whether there are differences in behaviour towards their students between male and female teachers. This kind of problem is outside the scope of this report, but a reference can be made to Wheldall, Merrett & Houghton's study (1989), according to which women teachers clearly disapproved of their pupils' behaviour more frequently than their male colleagues. In fact, maths teachers proved the most positive and teachers of foreign languages the most negative. A high percentage of foreign language teachers stated they had spent more time than they should have on problems of order and control and that they reported the highest numbers of troublesome pupils in their classes. (Wheldall, Merrett & Houghton 1989, 24; see, however, Sutton 1991, 483 about sexism in maths classrooms) In computer-mediated communication, one could argue, the problem may also arise from possible gender insensitivity hidden in teachers' use of language, ways of dealing with boys' responses differently from girls' responses (cf. e.g., Wood & Lenze 1991):

> "Pedagogical process is also constituted by communication style that may be more or less gender sensitive. Consistently, researchers have shown that the style characteristic of most contemporary western classrooms tends to favor men's ways of thinking and learning and to disconfirm women's ways (...) Thus, in most classrooms, asserting self is more rewarded than waiting one's turn, individual achievement is valued more highly than collaborative efforts, talking is encouraged more than listening, presenting new ideas is emphasized whereas responding to and synthesizing classmates' ideas is not, competition is stressed more than cooperation, and advancing firm conclusions is

> more highly regarded than holding tentative ones." (Wood & Lenze 1991, 17)

Although Wood & Lenze's views (1991) may depict an average classroom, it must be borne in mind that a lot has been done in this respect; co-operative or collaborative learning, for instance, utilises more learner-generated initiatives than more traditional classroom teaching does. Besides, learning to wait for one's turn, as an example, is one of the basic school-going skills taught even at the lower levels of the comprehensive school. Once again, life in school classrooms may turn out to be more multi-faceted than the above description gives us to understand.

There is some evidence (cf. e.g., Griffiths & Alfrey 1989) that teachers' attitudes towards computers are affected by their sex to a very limited degree. However, Griffiths & Alfrey (1989, 77) contend that we are witnessing a stereotype in the making: the fact that men rather than women use computers and learn more about them, can be seen as a chance by-product of the way computers have been introduced into schools. Kammerer (1989) also underlines that *Computer-Wissen bedeutet Macht* and goes on to make 26 suggestions for an equal access to computers for girls.

In the Finnish school context, one of the reasons may also be the content areas of Information Technology as an independent school subject. Although increasing the general level of awareness of IT applications and their significance to society is one of the main topics, some other themes are probably felt to be too technical—perhaps unjustly—to be appreciated by the girls.

The nature of software programs is also considered to affect girls' attitudes somewhat negatively. Along with the tradition of CAI or CAL programs, software available has often been tuned to the boys' feelings, being rather competitive, full of aggressive and warlike action, loud noises, and rapid unexpected shifts from one scene to another (cf. e.g., Fisher 1984; Gabriel & Smithson 1990; Meisalo & Tella 1988; Sanders 1984; Self 1985; Yeloushan 1989). Forsyth & Lancy (1989, 53) even contend that this kind of software tends to enhance boys' attitudes and skills, while the reverse may be true for girls. In this sense, software tools, such as word-processing and e-mail, cannot be regarded as gender-biased. On the contrary, it could be argued that these kinds of computer programs are gender-neutral, offering the same kind of challenge to both boys and girls. As tools, they cannot be taken for more than advanced aids which contribute to fruitful working in the direction of general aims and objectives.

Hattie & Fitzgerald (1987) carried out a meta-analysis of empirical studies and found small differences in attitude and no differences in achievement between boys and girls. Their study was conclusive of small differences in attitudes, but pointed to a polarity in that as many males as females liked computers, but many more girls ardently disliked computers. At primary level, no differences were found between boys and girls in usage and attitudes to computers. However, differences became more pronounced when students progressed through secondary schools. This development could be explained by a psychological developmental trend, or by a cultural developmental trend in that children in today's schools, compared with those a few years ago, have a richer and greater exposure to computers. (Hattie & Fitzgerald 1987, 3, 8) The meta-analysis made by Hattie & Fitzgerald (1987) identified six different kinds of computer usage (drill and practice, tutoring, computer-managed learning, simulations, programming, and Logo). Insofar as e-mail was not included, it is difficult to conclude whether the research findings are valid in this respect too. In many ways, computer-mediated communication differs from more traditional patterns of computer use in language learning. On the whole, many of the research reports deal with CAI or CAL, not software programs like word-processing, electronic spreadsheet, etc.

On the other hand, Hattie & Fitzgerald (1987) deplore the paucity of empirical research. Of the few studies they located, the conclusion was that "there were no differences relating to achievement outcomes, and the effect-size for attitude outcomes [was] not indicative of *substantial* differences between males and females. Yet, if the effect-size is greater with older students (as is indicated by the meta-analysis), the discrimination against females could develop into a substantial effect. (...) It is difficult to find evidence indicating differences between males and females in the amount they learn from computers and in the time taken to learn. When girls use computers, they learn as much and, if anything, often learn faster than boys" (Hattie & Fitzgerald 1987, 9, 23).

Clarke (1990) summarises eight strategies for change, which necessitate that (i) computing is introduced at an early age and that (ii) category-based expectations do not arise. He also recommends that (iii) the number of visible female role models should be increased and (iv) computers be dissociated from mathematics and technology by introducing them across the curriculum, rather than predominantly in mathematics, computer awareness, or programming classes. In addition, (v) we should focus on the use of computers as tools rather than as objects of study. Clarke contends that an emphasis on the usefulness and relevance of computers as tools for all students is more likely to appeal to girls as they are more interested in tool use, and most of the tool software (word-processing, spreadsheets) is not sex stereotyped, and tool use is more related to future activities and occupations, and therefore seen to be relevant. An equal emphasis should be placed on activities enjoyed by girls (e.g. word-processing) and by boys (e.g. simulations). Further, (v) such computer access policies should be developed that ensure equal access for girls and boys to computers both within classes and in non-class time; (vi) an awareness of the potential for sex bias should be created, while (vii) activities that require collaboration should be included by arranging computing rooms to facilitate informal communication and collaborative work. Finally, (viii) girls should be provided with effective instruction to compensate for their lack of experience within programming or computer science teaching. (Clarke 1990, 62—63)

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To sum up, research on issues of gender and the use of Information Technologies is abundant. Research findings, however, are rather contradictory. In addition, they mostly originate from school contexts that differ from those in this country, which makes it difficult to generalise. Yet it seems obvious that if gender sensitive issues are taken into account, both boys and girls can take advantage of modern Information Technologies at the school level. Furthermore, a lot can be done to prevent gender insensitivity if the teachers, for instance, are well aware of the problems involved.

2.4. Attitudes and Preferences Seen Through Change

Attitudes and preferences can also be studied from the perspective of change. Hersey & Blanchard (1985), for instance, divide changes into four levels: (i) knowledge changes; (ii) attitudinal changes; (iii) behaviour changes, and (iv) group or organisational performance changes. It is quite easy to make changes in knowledge by giving a book or article to read. Attitude structures are emotionally charged in a positive or negative way, which makes them more difficult to change than knowledge. Changes in individual behaviour seem to be significantly more difficult and time-consuming than either of the two previous levels. As to the implementation of group or organisational performance, it is compounded because at this level we are concerned with changing customs, mores, and traditions. Changes may occur through two different cycles—the participative change cycle and the coerced change cycle. The former is implemented when new knowledge is made available to the individual or group. The latter cycle begins by imposing change on the total organisation, which tends to affect the interaction and influence the system at the individual level. (Hersey & Blanchard 1985, 63—64)

The change cycle of the present research project could be called participative in the sense that teachers stressed the optional character of the fieldwork period; on the other hand, it could be characterised as coerced, however, because they were all asked by me as the researcher to participate in the project. As soon as the participating teachers had decided to take part in the project, they more or less felt compelled to participate. In Hersey & Blanchard's opinion (1985, 65), the main advantage of the participative cycle is that once accepted it tends to be long-lasting, since the people are highly committed to the change, but it tends to be slow and evolutionary. They also add that these cycles should not be described as if they were either/or positions, because in reality, it is more a question of the proper blend of each, depending upon the situation. Buckley & Perkins (1985) carry this concept analysis somewhat farther by their argumentation:

> "*Transformation* is a profound fundamental change in thought and action which creates an irreversible discontinuity in the experience of a system. *Change* is the modification of beliefs, behaviors and attitudes. Change is moving to another location on the same floor.

> Transformation is moving up a floor. Leaders guiding a transformation find that in a transformation multiple forces converge to catalyze the change. Transformative change occurs on three levels: structure: the patterns of the organization (i.e., reporting lines, job definitions); behavior: the way the system acts (i.e., communication patterns and relationships); and consciousness: the way things are viewed (i.e., attitudes, belief and myths). The timing and rhythm of the transformation is based on the entire system's readiness to shift on each of these levels." (Buckley & Perkins 1985, 45)

In this research project, the term 'change-oriented' has been used to refer to a tendency to favour a new innovative teaching and learning environment, not necessarily implying any negative or positive connotations (cf. also Rogers, Noblit & Ferrell 1990). A co-operative or collaborative learning environment, however, brings with itself a certain amount of emphasis on the beliefs, behaviours and attitudes of the participants. One of the assets of the fieldwork period lies in the fact that it sets things rolling, i.e., it puts both teachers and students participating in it in a position in which they will find it natural to rethink of the factors included in the learning situations. In other words, the way the teaching/learning environment is being structured, i.e., the several ways teachers control such classroom environmental resources as time, space, human energy, and materials (cf. Costa & Lowery 1989, 9), may be changed from within, that is, through the measures the participants commit themselves to taking.

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To sum up, then, when these thoughts are mirrored to computer-mediated communication, one has to bear in mind that the question is complex and multi-faceted also in that e-mail represents one part of a computerised learning environment. The basic question then is to distinguish between various strata, e.g., the attitudes or preferences directed in an unanalysed and global way towards any educational technology used in FL education, including OH projectors, video recorders, tape recorders, etc. Computers have been introduced into most Finnish schools only fairly recently, at least into FL education, so any hostility towards them may just reflect earlier antipathy towards educational technology used by the teacher or by the students themselves, such as, for instance, recorders in an old-fashioned language laboratory. If this is the case, this kind of attitude must not be interpreted as a negative attitude specifically towards the use of computers and e-mail. It must also be borne in mind that this works at teachers' level as well, and is probably but not necessarily in connection with teachers' age. If this barrier is surpassed, only then can computer-mediated communication be focused upon. Even then the issue is not necessarily of attitudes but only of preferences. For instance, students might feel more secure when preparing their compositions with pen and paper, instead of having to make use of a technological tool unfamiliar to them. Change and innovation are not the same thing, and change usually takes time to take place. Students' preferences also depend a lot on their expectations of the outcomes they can achieve with the aid of new technology. Students at senior secondary school level are rather conscious of cost/effectiveness (cf. e.g., Konttinen 1985) and measure the utility of some new activity through possible gains to be achieved. If students have little experience of working with a computer, their attitudes and preferences may also be affected by and developed through free associations and general beliefs, such as computing being associated exclusively with technology and other aspects of life more closely related to boys, men, and maleness in general. As to reactions to innovations in general, LeCompte & Goetz (194, 42) argue that participants probably respond to innovations in a variety of unintended ways, rather than in the manner intended. Fundamentally, this problem area concerns the realisation of an open, multimedia-based learning environment in a foreign language classroom setting.

It must also be pondered upon whether students' answers reflect larger logistical-critical barriers adopted from the surrounding society. Girls may (or may not) believe they are inferior to boys, with regard to a fair command of computers.

Finally, Finnish senior secondary schools accommodate more girls than boys. It is argued that the general study plan (the choice of school subjects) at this school level might favour girls more than boys—there are several foreign languages and in general liberal arts are perhaps better represented than natural sciences and mathematics, for instance. Perhaps—but this has to be put forward rather cautiously—a more generalised use of computers in FL education could give boys some more scope and motivate them to have a deeper interest in liberal arts. In this sense, computer-mediated communication may also favour boys and thus balance the situation if it is found to be abnormal. The present research report aims to shed some light on this problem from the point of view of the use of e-mail and computer-mediated communication.

3. Research Methodology

The choice of the research approach of the present research project, reported in three independent volumes (Tella 1991; Tella 1992a; the present report), is mainly based on an interpretive interest of knowledge, corresponding thus largely to the theory of coherence. Yet different interests of knowledge seldom appear as such in practical research work (cf. e.g., Habermas 1972; Uljens 1989; Young 1989). In this research project, the practical consequences are concerned, among other things, with the Finnish students' wishes and recommendations concerning their future learning environment. Consequently, then, focus on the interest of knowledge is partly shifted from an interpretive interest of knowledge towards an emancipatory interest of knowledge and towards the pragmatic theory. This kind of focus lays a decisive emphasis on practical and logistical consequences of certain acts when searching for truth.

Within interpretivism, an ethnographic approach was chosen, accentuating naturalistic and qualitative aspects of research and contextualism. Naturalistic is regarded here as an opposite to a strictly controlled experimental research design, while qualitativeness mainly refers to data gathering and analysis techniques (for a closer presentation, cf. Tella 1991). Contextualism is used to refer to a social context, though linguistic and cognitive aspects are not ignored. The approach does include certain elements of phenomenological research (cf. e.g., Tesch 1990) in that its purpose is to illustrate an intersubjective human experience by describing its core or substance. Still, the present approach differs from it by working on several individuals (participants) at the same time; one of the customary features of phenomenological research is to concentrate on one document or one interviewee at one single time.

An ethnographic approach was thought as particularly relevant in an open learning environment, like the one carried out during the fieldwork period of this project (from November 1989 until May 1990). These choices carry with them epistemological implications, i.e., issues concerning the nature of knowledge and truth. As the whole project was designed to be an exploratory, collaborative, and change-oriented developmental research, geared towards introduction of a technological innovation and strategic action initiated by all the participants involved, also issues of ontology were of primary importance. Ontological implications are partly concerned with educability or trainability of human beings as well as with prerequisites and feasibilities connected to them. The focus has been shifted from the participating teachers' perspectives via those of the researcher towards the views, opinions, attitudes, and preferences expressed verbally or in writing by the participating students. The constructivist view of knowledge, based on the idea of learners reconstructing the new knowledge acquired by formulating ideas and concepts into words, also underscores the importance of self-directed development, which, hopefully, can be seen through students' views expressed during fieldwork and analysed in this report. Ethnographic research often utilises features of a phenomenographic approach (cf. e.g., Gröhn 1989; Marton 1981; Uljens 1989) in that not only facts ('from outside') but also participants' perceptions ('from within') are studied. In this sense, the present research can also be called phenomenographic in nature. This kind of an insider's viewpoint is also often called 'emic' (e.g., Fetterman 1984, 23; Hämäläinen 1987, 9).

If the characteristics of language are interpreted as interactive elements of culture, this easily leads either to symbolic interactionism or ethnomethodology (cf. Tesch 1990, 61). Certain techniques used in ethnomethodology, such as incongruity procedure or, on the whole, the use of 'indexical expressions' (cf. e.g., Tesch 1990, 61, 82), do not lend themselves easily to the present research approach. However, a symbolic interactionist perspective, also arising from within the phenomenological research tradition, is important in this research, as norms and values as well as aims and goals specified by outsiders (in this case, teachers, curricula, researcher) are often surpassed by students' own interpretations of their learning environment (cf. e.g., Blumer 1969; Jacob 1987; Taylor & Bogdan 1984; Tesch 1990).

As far as the interpretive character of human experience is focused upon, symbolic interactionism must also be linked to the anthropomorphic model (e.g., Harré & Secord 1972, 6), according to which participants in a scientific treatment should be treated as analysers, commentators, and critics of their own (and other people's) conduct. In this report, the Finnish students play the most decisive role, as it is their appreciations and preferences that are being studied, analysed, commented upon, and reviewed by themselves. The main difference between a quantitative approach and a qualitative one (as in this report) lies precisely in the role of an individual participant. Within an interpretive, ethnographic research tradition, individuals are allowed to speak for themselves, and it is the researcher's task to add these tones to the global "ethnography" or description of the lives of these individuals. Consequently, a symbolic interactionist perspective as well as that of the anthropomorphic model, and its essential principle of ethogeny, are fundamental grounds on which interpretations are created and elaborated.

There is a basic difficulty when a technological innovation, such as an international communications network and the use of e-mail, is cross-connected to aspects and analysis of human development. However, in order to better understand how computer-mediated communication could be integrated into teaching foreign languages, for instance, we need certain frameworks or scientific "ladders" which enable us to analyse the situation through concepts forming a larger whole. In the following, two such frameworks are being utilised in order to set the Finnish students' comments, views, and suggestions into perspective. Some of the students' opinions will be analysed with the aid of a qualitative based content analysis of their responses to questions presented in a written questionnaire. These opinions will further be looked upon through Perry's Map of Cognitive and Ethical Development (Perry 1981) and through a Social Factors Model (Feenberg & Bellman 1990, 72—75).

Perry's Map of Cognitive and Ethical Development (Perry 1981, further developed by McCreary 1990) provides a framework which facilitates the analysis of individual persons' views of their working and learning environment. In this map, people have nine positions (stances or perspectives) from which they interpret and judge what other people say or do. The nine positions are sequenced through dualism, multiplicity, relativism, and commitment. At the stage of dualism (positions 1—2), people tend to see everything in black and white, in opposites of right or wrong, with no intervening compromises. According to Perry, at this stage people feel right answers exist somewhere and authorities have the answer. The second stage of multiplicity (positions 3—4) is characterised by atomistic, fragmentary, and arbitrary personal opinions, based on the belief that authorities know some of the right answers, but having some more scope for personal views. The stage of relativism (positions 5—6) is based on the acceptance of the existence of irreducible uncertainty, disciplined metathoughts which help to analyse and judge the diversity of opinions for their relative merit. The last stage of commitment (positions 7—9) enables the individual experiences to the full, making choices and affirmations resides within oneself, not outside in the certainty once granted by authorities. This stage requires constant analysis of one's commitments and their role to the interpretation how to view the world around oneself. The merit of Perry's map (1981) is in that it allows us to analyse in greater detail the relationships between utterances of individual users of language also in international communications networks. In McCreary's view (1990, 128), Perry's model makes it easier for us to look beyond the substantive differences between statements so as to analyse the cognitive and ethical assumptions underlying the way people may be thinking and at the same time it offers benefits for every participant aspiring to be collaborative. Growth towards the higher stages of the model are at least considered feasible if not inevitable in every case. This model will be utilised in the chapter on Results and Interpretations as one way to structure the Finnish students' opinions as expressed in the student questionnaires. Overall, a symbolic interactionist perspective (e.g., Blumer 1969; Jacob 1987; Taylor & Bogdan 1984; Tesch 1990), the anthropomorphic model (Harré & Secord 1972), and Perry's model (1981) complement each other and serve as a background philosophy in the interpretation of the fieldwork participants' experiences, views, and opinions.

The Social Factors Model (Feenberg & Bellman 1990, 72—75), on the other hand, aims at combining the sociological analysis of group behaviour and group needs with the technical capabilities of computer-mediated communication. One of the central constructs of the model is "communications requirements", which refers to the group needs or problems addressed specifically by the appropriate configuration of communication systems. This, naturally, varies from one target group to another. The major components of this model will be presented below and will subsequently be adopted for the analysis of the data gathered during the fieldwork period and reported in the chapter on Results and Interpretations.

The Social Factors Model includes four master profiles of typical user needs, viz. (i) conference production, (ii) retrieval of materials deposited in the conferences, (iii) pragmatics of the on-line communication process, and (iv) management of on-line groups. These four master profiles are then divided into smaller components (see *Chart 1*). Even if this model basically refers to computer conferences and not uniquely to e-mail systems, it will be of help in this report, as the communications networks used during fieldwork consisted of both e-mail and access to computer conferences, electronic noticeboards, and to some databases.

Chart 1. Components of the Social Factors Model (Feenberg & Bellman 1990, 73—74).

Production	Access	private message
		group message
		public conference
		private conference
		bulletin board
	Group process	action support (decisionmaking tools, etc.)
		contextualisations
		leadership
		rate of interaction (synchronous/asynchronous)
	Relevance	conference architecture (group or topic centred)
		overload protection
		norms of contributions
Retrieval	Time	alarms
		reminders
	Reference	indices
		key words
		title displays
		conference architecture search programs
		hypertext
	Sharing	data
		programs
		lists
		documents
Pragmatics	Friendliness	syntax
		learning
		guidance
		help
		error control

	Identity	public (real name assignments)
		private (anonymous, pen names)
		subscriber information
	Safety	security
		secrecy
		reliability
	Inputs	mathematics
		texts
		graphics
Management	Accounts	opening
		grouping
		billing
		updating
		enrolling in conferences
	Tailoring	help files
		command prompts
		opening screens
		system as a whole

The model gives a systematic order to research into the adaptation of computer-mediated communication programs to the needs of different groups of users, but it does not take into account individual considerations of group members (Feenberg & Bellman 1990, 75). However, even in its present form, most of the model can be used to support the analysis of the themes of this study. Even if the main starting-point is technological, individual values and appreciations can be approached through this model.

As explained earlier (Tella 1991, 58—66), the main data gathering techniques used both during fieldwork and prior to and after it included participant–observation, analysis of electronic and printed files of e-mail correspondence between different participants, informal discussions and chats with the participating teachers (and some students) connected to planning and assessment sessions, and teachers' and students' questionnaires. In this report, review of the data will be resumed, partly through a content analysis of the students' questionnaires, but supplemented and complemented with low-inference and high-inference comments from the e-mail correspondence saved as text files and printed on paper. A number of comments and remarks were recorded in informal chats and discussions with individual students. The basic aim of using some student questionnaires was to complement the picture conceived from students through observation and informal interviews plus video and audio recordings.

Methodologically, then, the research approach adopted for the present study, is ethnographic, which, in the light of prior experience of computer-assisted language learning, is a working approach (cf. e.g., Linnakylä, Sajavaara & Takala 1991, iv; Pederson 1987). It is not quite simple to decide whether parts of the approach lean somewhat on ethnology (i.e., on comparative analysis of multiple entities of the research objects), but if ethnography is understood as a study of phenomena interpreted as individualistic entities, then, research on pedagogical innovations, such as the introduction of international communications networks and e-mail into foreign language teaching, belongs to this research tradition beyond reasonable doubt. However, more emphasis will now be put on students' opinions, perceptions, and feelings *vis-à-vis* the use of computer-mediated communication in the teaching of English as their first foreign language. As in the two preceding reports, ethnographic significance is understood to be derived from a social context, not so much through statistical analysis (cf. Wolcott 1988, 191). A number of charts will be presented, though, to illustrate certain points, so that the ethnographic techniques will be supported by some quantitative calculations. All in all, a number of complementary suggestions will be presented, with a view to enhance the "polyphonic" tone of the report (cf. e.g., Geertz 1988; Hess 1989).

When students' ideas and written comments are analysed, it is crucial to realise the importance of language. Goetz & LeCompte (1984, 96) refer to the issue of language fluency (cf. also LeCompte & Goetz 1984, 41). In the preparation of the present report, this viewpoint comprised several hidden threats, i.a. the fact that the school setting was apparently familiar to me as a researcher. The Finnish students' comments on the questionnaires were in Finnish, while they expressed themselves in English in e-mail correspondence. On the whole, it can be concluded that although the Finnish students formed a sample of limited-English-proficient student population, they could express themselves comprehensibly and at best accurately in English as well. The meaning of certain words or quantifiers used by the students when speaking or writing in their mother tongue may naturally differ from my interpretations of them. This was a risk to be taken, but it was minimised by several facts. First, I got acquainted with these students through active participant–observation over a long enough period of time. Second, numerous discussions with their teachers shed light on their behaviour and on certain choices of words. Third, my own background as a teacher trainer and as a teacher of English probably increased my comprehension of their intentions. Furthermore, I tried to be aware of the *argot* used by the observed.

Another viewpoint needs to be mentioned. As the Finnish students were asked to fill in the questionnaires, they were at the same time asked to reflect upon their inner feelings and perceptions. In other words, certain emphasis was laid on their metacognitive skills. In addition, answering the questionnaires gave them an opportunity to develop analytical skills and, perhaps, their ability to construct logical arguments or reconstruct the reality and the experiences they had gone through during fieldwork.

4. Research Problems

In this chapter, the research problems will be presented, to be answered in the subsequent part of the report. The problem areas have partly been derived from the research findings explicated in the first part of this report. Answers to these problems are also being searched in order to find out in what ways an open learning environment, supported by the use of international communications networks, computer-mediated communication, and e-mail in particular, could be further developed. Although the viewpoint is essentially focused on the views and ideas expressed by the Finnish students, it is natural that their feedback reflects the experiences shared with their teachers and me as the researcher. Much of what the Finnish students experienced, felt, and sensed was based on the interactionalist character of e-mailing between the Finnish and foreign partner schools.

4.1. Gender Sensitivity

This research problem area is concerned with issues connected to computer equity/inequity, equality education, various opinions and preferences between boys and girls concerning the use of computers. The research problem area will be divided into the following questions:

- Do boys and girls have a similar background as far as computer access is concerned?
- How gender sensitive can computer-mediated communication and the use of e-mail be?
- In what way does the use of e-mail lower any possible computer inequity?
- What sort of social factors are involved in the use of e-mail in international communications networks?
- Which sex or what kind of students seemed to profit from computer-mediated communication and the use of e-mail?

4.2. Achievability of Aims

This is partly the subjective level of the design, accentuating the experiential component of the Finnish students' partnership in the implementation of the fieldwork period. This research problem area is concerned with the Finnish students' views, opinions, and ideas concerning the achievability of the aims and goals of FL studying, when assessed through their own experiences and feelings during fieldwork. The question here is about how the students felt the aims set for their studying by the official curriculum could be combined with those offered and suggested by computer-mediated communication. Another aspect is whether computer-mediated communication could fruitfully be integrated into their classroom work as a new kind of tool or a teaching method.

This research problem area is also concerned with student generated or sponsored disturbances (intentional or unintentional) regarding the general classroom management, which prevented other students from working in the direction of the aims and goals set for their work. In order to develop an e-mail sponsored learning environment, one has to pinpoint these hitches, no matter what caused them. Technical hitches and disturbances will not be included, as they have already been dealt with (cf. Tella 1991).

Another aspect of this problem consists of the students' initiative taking vs. simple reacting to what the teacher suggests, and their co-operation (or lack of it) with their teachers and myself as the researcher. Initiative is understood here to include students' voluntary acts, such as volunteering to do something connected to e-mail working. The main emphasis lies in the question of how students work and interact together, how their expectations are met with, and how computer-mediated communication seems to fit in foreign language learning from the students' point of view.

This research problem area will be explored by analysing the questionnaires the Finnish students filled out during fieldwork, complemented by informal chats and discussions with them. Analysis will be focused on the students' views and opinions about the use of communications networks and e-mail in class situations. From the students' point of view, the question is in fact of a metathinking analysis they were asked to make.

Some of the conclusions will be based on video or audio recordings made during fieldwork, others on participant–observation of the classroom situations. An important source of information, naturally, consists of the students' e-mail correspondence, although it is not centrally focused upon in this report.

This research problem area will further be divided into several questions:

- How do the Finnish students assess the achievability of the aims and goals set for FL studying from the point of view of the e-mail project?
- What do they assess having profited from the e-mail connection with their foreign partner school?
- What aspects would they have liked to stress more in computer-mediated communication?
- Did the e-mail project promote wishes expressed by the students to go on using e-mail as a tool?
- What sort of initiative did the students take in terms of computer-mediated communication?
- What sort of disturbances occurred and how did they affect the general working atmosphere in a learning environment based on computer-mediated communication?

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Answers to the above research problems will be searched by analysing the data gathered during the fieldwork period of the research project (November 1989—May 1990). The fieldwork period included three Finnish senior secondary schools[1] (called Schools A, B, and C), four teachers of English (called Teachers A, B, C1, and C2), and 134 students from six Form 1 or Form 2 classes).

The foreign participants—either teachers, students or researchers—came from nine different countries (Britain, the USA,

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[1] As in the previous reports (Tella 1991; Tella 1992a), the privacy of the Finnish portrayants (schools, teachers, and students) is ensured by using pseudonyms throughout this report (the use of pseudonyms, cf. e.g., Armstrong 1987, 27—28). Any foreign participants are named directly, however, in order to enhance authenticity. I was informed of no refusals by the foreign participants concerning whether their names could be cited in the reports of this research project.

Austria, Canada, the former German Democratic Republic, the former Federal Republic of Germany, Japan, Iceland, and Sweden). (A detailed description of the participating schools, teachers, and the main e-mail links established for the fieldwork period, cf. Tella 1991).

5. Results and Interpretations

In this chapter, answers to the research problems will be analysed. The problem areas will be dealt with in the same order as they were introduced in the preceding chapter.

5.1. The Finnish Students' Questionnaires

During the fieldwork period (November 1989—May 1990), the participating Finnish students were administered two questionnaires; the first (see *Appendix A*) after the first period during which they had been involved in the e-mail project, and the second (see *Appendix* C) at the end of the spring term in May 1990. In practice, the first questionnaire was filled out in January or in February 1990, depending on when the first period ended. Teacher C1's Form 1 was an exception, as it only contributed to one study period only. These students were asked to fill out the latter questionnaire only. To summarise, the Finnish students were administered the questionnaires as follows:

Chart 2. Administering the student questionnaires.

Teacher	Form	Date
A	1A	Jan. 1990 and May 1990
A	1B	Feb. 1990 and May 1990
B	2	Feb. 1990 and May 1990
C1	2	Feb. 1990 and May 1990
C1	1	August 1990
C2	2	Feb. 1990 and May 1990

The first questionnaire was administered on Jan. 3rd, 1990 in School A. Slight modifications of wording were made for the next version of the questionnaire, which was then administered in Schools A, B, and C in February 1990. The questionnaires administered in May and in August 1990 in all the three schools (six classes) had the same wording, except that the papers distributed to the students had the name of their school, their class, and the name of their teacher on the cover page. For practical reasons, only two versions are reprinted in *Appendices*. A number of similar questions were included in the first and second questionnaires so that it could be compared whether the students' views had changed or not.

The students' questionnaires were originally printed in Finnish, but English language translations are given in this report (see *Appendices B and D.*) The questionnaires were administered by their own teachers of English during an English language lesson, but not in the computer laboratory. The teachers were asked to report any unexpected episodes that might have taken place while the students were filling out the questionnaires. Likewise, the students' possible questions and additional comments or complaints were asked to be reported to me. The only comments were made by Teacher A. She reported in January 1990, with regard to Form 1A (School A) that some students had been slightly amused at the question "Are you a boy or a girl?", but had been happy about the teacher's explanation that as some Finnish first names apply to both boys and girls, I wanted to be sure about who was who. The wording of this question was explained to Form 1B (School A) before they started filling out the questionnaire in February 1990. Some students of Form 1B (Teacher A) wished they could have answered this questionnaire later after having received more personal messages from the foreign partner school. This was, however, something I did not want to take place, as the study period was being followed by a zero ('blank') period, during which no English was studied and because the first questionnaire was intended to survey students' initial impressions and opinions.

The background question of the students' age also aroused some embarrassment, as a few students did not know whether to write 16 or 17, as they would be 17 in the near future. As an answer to the question of whether the students had already used any software, the student who became a key informant in School A promised to provide me with a seven-page-long list of all the computer programs he had been fiddling with, but no list was ever given to me, after all. On the whole, the students answered the questionnaires in a business-like manner. Only a few boys had scribbled uncalled-for additions on their sheets and refused to write their names when asked. One boy complimented me on—as he put it—a most successful layout of the questionnaire.

As mentioned above, Teacher C1, who did not teach Form 1 during the last period of spring 1990, could not administer the questionnaire in May 1990, despite his efforts because of overlapping timetables, so he asked the students to fill out the questionnaire in August 1990, after the students had started a new school year. This delay was unfortunate, but it was agreed that this procedure was, however, better than having no written opinions of Form 1 students.

In this report, only those questions of the questionnaires that have direct bearing on the research problem areas will be analysed. Some other questions have been utilised in the preparation of the two earlier reports (Tella 1991; Tella 1992a). Besides, the student answers are compared with observations made during participant-observation, with the Finnish teachers' comments, and with informal interviews with some of the students.

Chart 3. The number of students per teacher and form.

Teacher-Form	Boys	Girls	Σ	
TA-1A	10	17	27	20,15 %
TA-1B	10	16	26	19,40 %
TB-2	11	19	30	22,39 %
TC1-2	6	11	17	12,69 %
TC1-1	8	11	19	14,18 %
TC2-2	8	7	15	11,19 %
TOTAL	53	81	134	100,00 %
	39,55 %	60,45 %	100,00 %	

In the following chart, a summary of the student questionnaires will be given:

Chart 4. Summary of the answers to the student questionnaire (January—February 1990).

Teacher–Form	Replies	No answers from	Comments
TA-1A	24	3 girls	(1)
TA-1B	25	1 girl	
TB-2	29	1 girl	
TC1-2	16	1 girl	(2)
TC2-2	14	1 girl	(3)
TOTAL	108	7	

(1) Two of the girls had been absent for quite a number of lessons during this period: 13 and 9 lessons respectively. Both girls were given Mark 6.
(2) Four of the boys had left their names out, but they could be recognised, however.—Teacher C1's Form 1 did not participate in fieldwork at this time.
(3) Her Mark was 5.

Overall, all the boys filled out the questionnaire, but a few girls did not. As to Teacher A's Form 1A, the main reason seemed to be absenteeism.

The next chart summarises the number of answers given to the second questionnaire:

Chart 5. Summary of the answers to the student questionnaire (May—August 1990).

Teacher-Form	Replies	No answers from	Comments
TA-1A	22	5 girls	(1)
TA-1B	23	-	(2)
TB-2	25	3 boys	(3)
TC1-2	14	3 girls	(4)
TC1-1	17[1]	1 girl, 1 boy	(5)
TC2-2	11	1 girl, 3 boys	(6)
TOTAL	112	17	

(1) The girls' final school marks were 7, 7, 4, 5, and 6.
(2) Three girls had left school before the end of the spring term.
(3) Two boys had quit school before the end of the spring term. Three boys did not answer (marks 7, 5, and 5).
(4) Three girls with excellent marks (10, 10, and 9) did not fill out the questionnaire. One student had left school before the end of the spring term.
(5) One boy (mark 7) and one girl (mark 8) could not be reached.
(6) Three boys (with marks 10, 10, and 8) and one girl (mark 10) did not fill out the questionnaire.

To sum, in Teacher C1's Form 2 and in Teacher C2's Form 2 some of the best students did not answer the questionnaire, while in School A and in School B it was the poorer students that did not fill it out. It could be assumed that these high achievers gave the questionnaire a low priority, as the spring term was coming to an end and they might have wanted to do something they assessed more important. Naturally, it may also imply discontent regarding the low communication proximity of the e-mail link with the foreign partner school. As to the underachievers, the reason could be assumed to be their deficient capacity to concentrate on something extra. Besides, their proficiency of English was very limited. However, the percentage of the answers can be regarded as quite satisfactory, because, as explained above, written answers were intended to complement the results obtained through active participant-observation and also through teachers' comments.

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[1] In fact, the number is 18, because there was one extra contribution from a boy who did not get a course mark at the end of Course 4 in the spring of 1990.

As part of the background information gathered with the aid of the questionnaires, the Finnish students were asked whether they had a microcomputer at home. This piece of information is connected to the basic question of computer inequity, i.e., whether girls can access the computers as easily as boys. The following information is based on answers given in the first questionnaire administered after the first period of e-mailing[1].

Chart 6. Frequencies of boys vs. girls having or not having a microcomputer at home.

Teacher–Form	Micro at home	No micro	Unanswered
TA-1A 24 students	6 boys 3 girls	3 boys 11 girls	1 boy
TA-1B 25 students	7 boys 4 girls	4 boys 10 girls	
TB-2 29 students	2 boys 6 girls	10 boys 11 girls	
TC1-2 16 students	4 boys 3 girls	1 boy 7 girls	1 boy
TC2-2 14 students	5 boys 3 girls	2 boys 4 girls	
TOTAL 108 students	24 boys/ 46 = 52.2% 19 girls/62 = 30.6%	20 boys/46 = 43.5% 43 girls/62 = 69.4%	2 boys/46 = 4.3 %

The results follow the anticipatory pattern of thought; more than half of the boys (52.2 %) had a microcomputer at their disposal at home, compared with 30.6 % of the girls. The number of girls (69.4 %) who did not access a computer at home is even higher if one extra fact is taken into account, viz. 13 girls out of 19 added that the home computer was not theirs exclusively, but belonged either to their brother or sister (10 mentions out of 13) or to their parents (4 mentions out of 13). One girl mentioned that there were two computers in her place, one used by her father or mother, the other was at her brother's disposal. Only 3 boys out of 24 mentioned that the home computer was not exclusively their own but shared by their brother (or sister). In School B (Teacher B), the girls having a microcomputer at home outnumbered the boys. The students were also asked what they used their home computers for. Almost exclusively those who had a computer at their disposal used it to play computer games; just a few mentioned word-processing, no other uses were specified. Quite a few students also mentioned that they did not use their computer very often.

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[1] Teacher C1's Form 1 was not included in this chart as they participated in the fieldwork project for one period only and was not asked the background questions.

5.2. Gender Sensitivity

This chapter will deal with gender sensitivity as experienced during the fieldwork period in e-mail-based computer-mediated communication. Gender sensitivity may manifest itself in students' inclination to co-operate with one another or in their voluntary acts to disturb other students (or the teacher), and naturally in their attitudes or preferences towards new technology, such as international communications networks and e-mail but also towards the use of microcomputers in the teaching of English. An important factor lies in students' computer skills, because students may behave according to innate stereotypic patterns they are not even conscious of and which therefore is difficult to show or prove. Students' general attitude to school-going may also affect their attitudes or preferences towards the use of Information Technology. Planning is one of the aspects that can easily be affected by gender sensitivity. Some aspects have already been discussed, such as the issue of topic choice (cf. Tella 1992a) and how students react to different groupings in class (cf. Tella 1991). One of the striking features altogether was that all dyads and small groups were one-sex groups; the two sexes did not mix when forming working groups or when being divided into new groups. Naturally, we must not forget that the participating students were adolescents or teenagers, so they might still have been at a stage of not fully developed maturity, which may also have affected the groupings. Briefly, the students liked to work in groups (of one sex only). Sometimes there were free computers in the room but generally nobody wanted to work at a computer of his own. Some research findings show, however, (cf. e.g., Sutton 1991, 486) that group composition has little effect on achievement or interactions.

This problem area has, however, to be approached also from the viewpoint of the characteristics of e-mail. As shown earlier (cf. e.g., Robinson 1990; Rubin 1992; Rubin & Bruce 1990, 257; Tella 1991), e-mail tends to encourage chatting, informing, and entertaining, which represent forms of written production not usually practised in teacher-sponsored school-based writing. It may be hypothesised that this would help those boys who are more or less against teacher-directed writing, more favoured by the girls. In this sense, e-mail could provide a stage on which even boys, not that eager to commit themselves to writing, could find more scope to express themselves freely. Another question, however, is whether these potentials are easy to realise in the middle of ordinary school life.

One of the basic characteristics of computer-mediated communication is the dimension of immediacy/non-immediacy. It is already generally acknowledged that the use of e-mail systems liberates the users from the restrictions of time and place, thus facilitating place-independent learning and collaboration instead of traditional place-based education (cf. e.g., Blystone 1989, 148; Harasim 1990, 45—46). Writing on an off-line basis of asynchronicity gives the writer some time to reflect upon his writing, it gives him time to think about the reply, while in the oral face-to-face communication more immediacy is needed, as responses have to be made almost instantaneously. One could wonder whether these features empower boys more than girls. At any rate, this dual character of e-mailing favours both boys and girls. The possibility to answer offline in a more reflective way favours slow students. Ingesman (1990) calls this a 'context-independent' discussion, more advantageous to 'slower' learners who are then enabled to follow their own pace and learning style. The concept of context has to be understood in terms of immediacy, as, when more broadly seen in discourse or discussional terms, the context naturally remains the same even if the replies are somewhat delayed. Harasim (1990, 47) even contends that in an active group responses can be experienced as "near-immediate" despite the fact that communication is asynchronous (i.e., not real-time). In the final analysis, however, the dual character of computer-mediated communication is flexible enough to permit both slow and fast learners (or writers) to act according to their own learning styles.

One side-effect of this independence of context affects the patterns of dominance in the classroom. Those students who are perhaps used to dominating the immediate oral communication situations may lose some of their touch now that part of the communication is shifted over to written production. It may also favour those shy or introvert students who feel they do not have enough self-confidence to always express themselves in class in face-to-face communication as often or as emphatically as their more self-confident classmates. This aspect is connected to relevant socioemotional factors that affect the students' level of performance, including motivation, anxiety, and satisfaction, among other things (cf. e.g., Harasim 1990). As to shy and introvert students, an increased emphasis on computer-mediated communication may reduce anxiety experienced in classroom in direct communication situations. Yet it may increase collaboration between students who want to have each other's support when working on a computer. In any case, working with their classmates, i.e., with peers, may reduce stress and anxiety felt by the students in teacher directed communication situations. In this sense, computer-mediated communication and the use of e-mail can be regarded as fairly democratic and contributing to gender-equity. Basically, it does not favour one gender more than the other.

From a technical point of view, it has sometimes been suggested boys prefer tinkering with computers (as well as with other machines and technical gadgets), while girls want to do something more practical with them. The way boys work with computers may vary from that of the girls. For instance, boys tend to prefer computer games, played with a joystick or even a mouse, which is not that prominent as far as word-processing is concerned. However, writing on a word-processor is not the only feature to be emphasised in computer-mediated communication. Even in the fieldwork period of the present e-mail project, other features were accessible, i.a., the use of computer conferences and electronic noticeboards. A number of databases were also available, especially on Campus 2000. When information retrieval, storing, and manipulation becomes more important in computer-mediated communication in comparison with pure word-processing, the balance between different activities appealing to both genders may slightly change. However, computers give the same channel open to both genders , so it cannot be concluded that it would increase or heighten the gender inequity in this respect.

Another key attribute of computer-mediated communication is the lack of the use of artefacts. As the addressees are not seen by the senders, the possible role of their clothing, other insignia, etc. is no longer significant. More generally, the lack of artefacts refer to human characteristics, such as age, status, and, naturally, gender. This does not imply that paying attention to the addressee would be less significant than in ordinary communication. On the contrary, as words become more important, taking heed of the recipient of one's messages should be considered highly relevant. Yet at the same time, focusing on the message, not on the qualities or characteristics of the recipient, should be instrumental with enhancing gender equity. In a virtual school context (cf. e.g., Hiltz 1990; Sawyer 1992; Tella 1992b), this kind of phenomenon is likely to take place rather extensively.

In the following, the major components of the Social Factors Model (Feenberg & Bellman 1990, 72—75) will be used to analyse this research question of gender sensitivity. To start with, it must be noticed that the e-mail-based fieldwork period devised and implemented in the present research project has certain prior conditions which affect some components of this model. First of all, the social situations of the project were included in the teaching of English as the students' first foreign language, which means that (i) part of the e-mail working took place in a foreign language the students had been studying for several years but which still remained foreign to them, hindering them from expressing themselves quite freely. However, to compensate this viewpoint, some of the advance planning took place in their mother tongue. A number of technical hitches somewhat lowered the motivation of the students (cf. Tella 1991) as the high communication proximity pattern that was reached for was not fully achieved for the whole span of the fieldwork period. Organisationally, a Finnish senior secondary school belongs to the set of educational institutes which has not been using computer-mediated communication in advance, so the first measure to be taken was to introduce the use of international communications networks and e-mail as a technological innovation. As both teachers and students were not very well accustomed to using computers or telecommunications software, some problems arose from these starting-points, which affected the learning environment socially and mentally.

As to production, the equipment used and the software adopted was not tailored for educational purposes in advance; rather, it represented ordinary business-oriented software, which from educational viewpoints was not ideal to start with. From the five various forms of access mentioned in the Social Factors Model, four were used. Most of the incoming/outgoing messages were of a private character, though group messages were also sent as an answer to the Global Village network, for instance (cf. Tella 1991, 56). The teachers and the students accessed some public conferences and electronic noticeboards (bulletin boards) on Campus 2000. Yet the main access was private or group message based, possibly leading to too dominant an emphasis of writing/reading activities in forms of exchanging e-mails as a substitute for traditional correspondence. As explained earlier, these kinds of activities may favour girls more than boys, as most of the boys tend not to commit themselves to self-directed writing as freely and spontaneously than girls.

As to utilising information retrieved from computer conferences, noticeboards, and databases, the main question related to gender sensitivity probably was connected to topic choice. As already reported in Tella (1992a, 119—121), certain topics due to increasing sexual consciousness were brought up by the students. Also, the question of one-sex schools was introduced by Mr Lawrence Williams, Teacher B's English partner school teacher (see Tella 1991, 55):

> "From: SCHOOLS.IT.UNIT (YOJ002) Delivered: Fri 12-Jan-90 17:35
> GMT Sys 11
> To: Teacher B
> Subject: KINGSTON-FINLAND LINK
>
> Dear [Teacher B] (...)
>
> The first messages which you will receive are, in fact from the younger pupils at a school near to me. It is called Tiffin School and has boys only in it. You might like to discuss your attitude to such an arrangement, as we understand that in Europe mixed classes are the norm! (...)
>
> Best wishes
> Lawrence"

Three girls in School B took up writing opinions for and against boys' schools, coming to a conclusion that a mixed school is the best, after all:

> "To: YOJ002
> From: Teacher B Delivered: Wed 7-Feb-90 16:09 Sys 10001)
> Subject: Schools2
>
> Our opinions about our school:
>
> We have only mixed schools here in Finland. In our opinion it's good because we have always got well along with the opposite sex. We think that separate schools would be very isolated and too protective. Differences between men and women would come out too strong.
>
> We like our school, there are many different age groups. Here are also extra courses, which are meant for both boys and girls. Art and music courses are some of the most popular ones. (...)
>
> In physical education we are however separated. It's good, because boys rather play basketball, than gymnastics like girls. We can go swimming, shooting, riding or anywhere we want. (...)"

Otherwise the question of sex was brought up only occasionally. One of the most notorious topics in the news in the spring of 1990 was the case of a sexually attuned postcard sent by some trade union bosses to one of the leading ladies in another trade union mainly consisting of female workers. The episode became public as the chairperson of this trade union talked indignantly about the postcard to the mass media. The girls chatting together reflected this incident:

> "Before [Teacher B] started, I listened to some girls thinking their tasks over. They seemed to be quite content with what they had already written. One of them jokingly added that now it would be time to write something about the notorious 'Tupolev brothers' card, which had been in the news for a month. Some more or less traditional topics came up as well; writing about aerobics, scouting, etc. Then the teacher started structuring today's lesson." (A fieldnote in School B on March 14th, 1990)

In the students' replies to Questionnaire 2, it was difficult to distinguish between students' responses to e-mail correspondence to utilisation of other materials accessible through e-mail, as this was not asked directly. The materials Teachers A, B, C1, and C2 took advantage of were obviously seen by the students as complementary stuff in comparison with their own textbooks and other printed material, which they did not associate with the global character of computer-mediated communication.

What was frequently asked for more was the possibility to exchange more private messages. As this wish came from both boys and girls, it does not seem to have been a gender-inequity issue at all.

The second component of production is concerned with group processes, such as action support, contextualisations, leadership, and the rate of interaction (synchronous vs. asynchronous). Leadership can be seen as a synonym for dominance in class, referred to earlier. E-mailing can be seen to have a democratising influence on dominance or power relationships in class. In the present e-mail project, the rate of synchronous interaction (on-line communication) was scarce and not particularly sought for. Off-line communication (i.e., preparing texts first on a word-processor before logging on to a communications network) does not favour either gender; rather it gives a chance to co-operative or collaborative working and learning in pairs or in small groups. Besides, off-line communication can be claimed to reduce possible stress caused by the awareness of being on-line and having to type something in by using a rudimentary line-editor.

The third component of production is concerned with relevance: conference architecture (group or topic centred), overload protection, and norms of contribution. From the point of view of educational e-mailing, these aspects are of secondary importance, especially in e-mail focused computer-mediated communication. However, the participating teachers and students got familiar with a topic centred conferencing on Campus 2000 (see Chapter 7.1.29 in Tella 1992a). The main impression, shared by all the Finnish participants—teachers and students alike, was that this kind of environment should be tailored to be accessed more easily.

On the whole, the issues of production of materials that mostly concerned the present project were connected to the question of synchronicity vs. asynchronicity.

The second of the four master profiles of typical user needs featuring in the Social Factors Model (Feenberg & Bellman 1990) is concerned with retrieval of materials deposited. This profile consists of time, reference, and sharing. On the whole, retrieving the information without cumbersome technical operations is by far one of the most important services the user will like to have at his disposal. In school conditions, all the questions connected to timing are essential. The users have to be able to start from a readily available system, which does not necessitate too complicated logon and in which searching for relevant information is made as user-friendly as possible. This will enable the users to select appropriate subject matter for the particular lesson or for any school project in a way which encourages further uses of the electronic system.

The third major component is associated with pragmatics, including aspects of friendliness, identity, safety, and inputs. This is extremely important from any ordinary user's point of view. Friendliness in Feenberg & Bellman's terms (1990) refers to a user-friendly man/machine interface, which allows the user to make the most of the system without provoking him with misleading instructions. The problem experienced during the fieldwork period of the present research project was that neither teachers nor students could necessarily distinguish between computer system originated problems from pedagogical problems connected to the use of computer-mediated communication. At the students' level, this is a question of a certain degree of stubbornness, i.e., decisiveness of not giving up until after a sufficient amount of effort. If this viewpoint is connected to Perry's Map of Cognitive and Ethical Development (1981), the question is how committed to doing his assignment a student is. If the level of cognitive and ethical development is only that of multiplicity or relativism, technical problems and hitches arising from the unfriendliness of the computing system may completely destroy the attempt of using computer-mediated communication. From the user's point of view, the issue of safety mainly refers to the reliability of the system or to the stability of a communications network (Rogers & Kincaid 1981, 298).

In general, it was found out during fieldwork, the students were more tolerant to mistakes made by themselves or by their teacher (or by me acting as a technical expert for a change) than to mistakes or faults caused by the communications system. The students, especially the girls, practically ignored the small group situations in which, for instance, one of them had left the absolutely necessary diskette at home, so that they all had to start from the very beginning. Some of the boys, especially in School B, on the other hand, grew impatient if this kind of a thing occurred, irrespective of what they had been doing. As long as the main computing site in schools is located in a computer-equipped classroom, the issue of reservation and allocation of time to various school subjects is a problem. In School B, again, as it happened a couple of times that the computer laboratory was unexpectedly occupied by outsiders, some of the boys grew irritated of not being able to continue with their assignment. According to my observations—and confirmed with discussions with Teacher B after the lesson—the boys' reaction was quite authentic, showing that they had really intended to work on their project that time. This kind of a logistical problem is not, of course, due to the pragmatics of a communications system; it rather shows poor organisation within the school timetables, but luckily it was exceptional and only occurred in School B.

Another aspect connected to safety problems is the question of secrecy. E-mail communication is undoubtedly at its best when carried out at personal level, without any outsiders' intruding. Computer conferencing, on the other hand, has different standards of safety, because in a conference of this kind all the contributions are normally accessible to all the users of the conference. Reliability in this context refers to the reliable storing and retrieving capabilities of the system, so that the user can reliably access any of the messages stored on the system. In e-mail systems, this usually means that a certain number of e-mails can be safely stored on the mainframe computer, although it is better to download the most important messages on to a diskette or on to the user's own hard disk to be elaborated on a word-processor. In order to realise the interconnections between these various systems and the relationships between different levels of use, an average user has to understand the basic technology at his disposal. Some of the comments by the students revealed that girls were slightly more impatient or anxious about not fully grasping at what level they were working at one particular time. In fact, one could argue, this is related to a certain sense of spatiality. Basically, the user has to be aware of several levels of operation: the level of the disk operating system, that of the word-processor, that of on-line communication inside a communications program, etc.

During the fieldwork period, only text-based messages could be transmitted. Neither graphic-based/voice-based e-mail nor audio/video recordings could be transmitted at that particular time. This is a development which may affect the gender generated issues in a way which is not easily foreseen right now. The question of transmitting mathematical signs and symbols is not that far from a study focusing on foreign languages, as one of the boys in School A particularly expressed his wish to correspond with a foreigner doing well in Maths or Physics. On the other hand, if the principle of high communication proximity is accepted, then materials could be transmitted via other channels of communication, even via traditional mail ("snail mail").

The final major component of the Social Factors Model (Feenberg & Bellman 1990) is concerned with management of the computing system. Billing is, of course, quite relevant in educational parlance, as has been seen in this country during the years following the fieldwork period, i.e., an economical regression has caused all school administrators to be more conscious of extra costs. What would seem more appropriate, however, for purely educational purposes, is the question of tailoring the communications system to meet the users' special needs and requirements. In a school context this would stand for a simplified man/machine interface with an enriched helping system and a direct link between a word-processor and the telecommunications systems. These kinds of e-mail systems do exist and are widely available and in use in business life, and, hopefully, in increasing numbers also in Finnish senior secondary schools. Then it would be easier for the teachers and the students to understand the potentials of educational computing, without having to spend too much time on coping with technical problems.

5.3. Achievability of Aims

This research problem area is concerned with the Finnish students' views and opinions of the use of communications networks and e-mail. In the two student questionnaires, some of the questions were asked twice, first in the questionnaire administered in January or February 1990, and then towards the end of the fieldwork period. The first questions were meant to make the students more aware of possible gains they could achieve through the e-mail-based fieldwork. At the same time, the students' answers guided the development of the actual fieldwork period. Part of the wording of the first questionnaire was changed before the second questionnaire was administered; as to Question 12 (*Appendices C and D*), for instance, politics was mentioned as one of the subthemes in the first questionnaire, but it was crossed out from the second questionnaire. The second time to answer the questions was to be based on the students' factual experiences during fieldwork, and it is these answers that will be analysed more specifically in this context (Questions 11—14, 23, and 24 in Questionnaire 2, see *Appendix* C.) On the whole, these questions accentuated the experiential component of the Finnish students' partnership in the implementation of the fieldwork period. At the same time, the students were required to be capable of "metathought", as they had to analyse their feelings at a disciplined metalinguistic level. In the following, the Finnish students' answers to these six questions will be analysed.

Question 11: *"Your class received a certain number of letters from England and several other countries. What interested you most in them?"*

The purpose of this question was to give the Finnish students a chance to evaluate the themes dealt with between them and their foreign partner school students. In this respect, it was natural that opinions between students of the four participating teachers (Teachers A, B, C1, and C2) differed from each other, as some of the themes were rather specific to one or two of the teachers. Besides, the students were asked to pin-point the most interesting aspect of the e-mail correspondence. Despite this request, some of the students expressed unanalysed views such as "Nothing at all" (Teacher A: 1 boy; Teacher B: 4 girls; Teacher C1—Form 1, 2 boys) or "Everything" (Teacher A: 3 girls; Teacher C1—Form 1, 2 girls). As can be seen, both boys and girls gave completely negative feedback, while completely positive feedback was given only by girls. In Perry's Map of Cognitive and Ethical Development (1981), these kinds of answers probably stay at the first and most unanalytical stage of dualism, where attitudes to various phenomena are polar (either—or).

Most of the students, however, gave more analysed answers to this question. The students—both boys and girls—had been interested in learning how foreign students spent their free time and what kind of hobbies they had. The fact that School A had an active period of exchanging letters with schools from New York towards the end of the fieldwork period showed positively in the students' answers; letters, greetings, and messages sent to and from New York were mentioned in several answers. The students had also been interested in what foreigners knew about Finland. In School A, one of the girls mentioned the Japanese recipes for a happy school life (cf. Tella 1991, 180—181). Two boys (Teacher A) expressed their interest in the use of a foreign language.

In School B, the girls were at once more analytic and more negative than the boys. The girls obviously developed from the stage of dualism in Perry's model of cognitive and ethical development (1981) towards that of multiplicity or even relativism, because they made more use of disciplined metathinking and judged the results obtained during fieldwork for their relative merit but from the students' own perspective. Two boys did not answer, while the rest of them pointed out comparisons and stories of the foreign students' working days, information on the foreign schools and studying in general, and what they had learnt about young people's hobbies and ways of spending their free time. In School B, four girls gave no answers to this question. The other girls also mentioned the English school life but also the foreign students' own opinions about the way the world goes round. Some critical feedback, also repeated in the girls' answers to some other questions in Questionnaire 2, was focused on the fact that the English partner school students had been younger than the students in School B, which resulted in a basic difference in interests.

As to Teacher C1's two forms participating in the fieldwork period, Form 2 reacted more positively. The boys mentioned the sense of humour, the foreign students themselves and their hobbies and, in general, their descriptions. One of the boys only wrote "Karen", referring to one of Mr Brown's students, with whom some of Teacher C1's boys exchanged a number of letters (cf. Tella 1992a, 202—203). The girls in this class pointed out the foreign students' life, hobbies, and free time. The comparative aspect was also mentioned. Canada was mentioned once, and so was Clare, another of Mr Brown's students (cf. Tella 1992a, 68—70). There were only two critical answers: one girl answered this question by writing two question marks; another girl simply answered that she did not know but presumed that perhaps the students themselves interested her most.

Teacher C1's Form 1 was more critical in their responses. Three boys answered nothing and two others said that nothing had interested them, an obvious sign of the fact that these students were still at the stage of dualism (Perry 1981) or in a state of contrasted polarities, without being capable of growing more analytical in their views. As the three boys having written nothing, however, received a high mark in this course (10, 9, and 8), I assume they prioritised other things and would have needed a more individualised approach and, perhaps, more challenges in order to have a higher opinion of the aims and goals set for the fieldwork period. The rest of the boys pointed out the students' taste, the interesting character of the themes dealt with, and the various themes discussed. The girls answered briefly but more positively. Except two non-committal replies ("I don't remember"; "I just don't know"), the rest of the girls' views were positive: everything (2 girls), different people's opinions, poems, the Japanese, going to school abroad, school and free time, and texts on school life in various countries.

As to Teacher C2, two boys did not answer, one boy wrote he could not recall, but all the e-mails had been boring in his opinion. Two other boys referred to a story about May 1st and to correspondence requests. Only one girl (mark 7) did not answer. The rest of them referred to the foreign students' opinions, foreigners' ways of life, opinions about the world situation, their own life and school. One girl remembered two foreign boys she had written to.

Question 12: *"In what way did you profit from the electronic link with a foreign school? Assess the following aspects and give some examples if possible: Language in general (English; Finnish)—Music—Hobbies—Spending one's free time—Culture—Anything else?"*

The Finnish students were asked to assess any profit they experienced from the e-mail link with the foreign partner school. This assessment included several subdomains suggested by me in order to give the students a more specific idea of what sort of aspects I had in mind. There was extra space to comment on any other aspects as well. This was one of the key questions as it directly pointed to the cost/effectiveness of the fieldwork period as experienced and felt by the students themselves. As mentioned earlier, the senior secondary school students are rather conscious of the cost/effectiveness factor because of the national Matriculation Examination at the end of the senior secondary school (their third year). The subthemes mentioned are derived from the national curriculum (Anon. 1985) and were thought of in advance as probable themes to be discussed during fieldwork. I further hoped the students would point out some other aspects they would appreciate in computer-mediated communication. The question will be analysed in the following one subtheme after another.

In School A, most of the comments were positive concerning the profit gained in the use of English. There were only three negative or non-committal answers given by the boys, and only one given by a girl. Most of the students, both boys and girls, assumed the use of e-mail and international communications networks had given them a chance to learn at least a few new words, to use more English than earlier, to have more practice in expressing themselves freely. The boys also pointed out that they had learnt authentic language and had been influenced by the foreign students' ways of writing and expressing certain ideas. One of the boys mentioned the use of dictionaries, which made him look up a number of new words. Another boy added that he had been encouraged to write as he noticed that not even the English can always write correctly! This is an excellent example of a stage of relativism (Perry 1981), in which the dominance of predetermined views is shaken by a direct observation through disciplined metathinking. The native speakers of English can be interpreted in the light of Perry's Map of Cognitive and Ethical Development (1981) as authorities, whose position of authority is not denied or even questioned at the stage of dualism. The boy's observation, however, shows that this kind of authority is based on a prior misconception, which makes things more relative.

In School B, all the boys' comments on the use of English were positive. They wrote about having learnt new words and expressions, having gained a better proficiency to write in English, and having profited from analysing the incoming messages on their own. This seems to point out some positive effects of autonomous working as well. The girls' comments were also positive. Only one girl wrote that "she could make use of lexis studied, but she did not feel having gained much profit from that". Lexis and orthography were mentioned several times. One girl wrote that she "had been given practice in writing and in composing comprehensible texts".

The comments by Teacher C1's Form 2 were laconic and critical. Just one boy had a positive attitude to any profit to be gained; another boy said he had learnt a little. Two girls gave positive feedback. One more girl had learnt some English; another—nothing. Teacher C1's Form 1 was slightly more positive. All the comments given by the boys were affirmative:

> "Somewhat"
> "Vocabulary increased"
> "I learnt to remember different words".

Two of the girls were cautious about their opinions, three others said they had profited from the fieldwork period. This Form 1, however, only participated in one study period of six weeks, so they had a much shorter period of being in touch with a foreign school than the others.

Teacher C2's boys and girls had all a positive view on the use of English. Not everybody, however, answered this question, so it has to be concluded that those who did not feel they benefited by the fieldwork period simply did not answer this question.

On the whole, concerning the use of English, this could be assessed as one of the most important aspects as it could directly be interpreted by the students themselves as connected to their ordinary study of English. The rest of the subdomains, naturally, are well covered in ordinary teaching but the point was whether the students could see the importance of these in connection with an e-mail-based fieldwork period. It could also be said that the first aspect (the use of English) of this question referred more specifically to the use of English as a means of communication, while the rest of the subdomains had more to do with topics, themes, and, in general, contents of the curriculum to be implemented. The themes and topics were analysed in more detail in Tella (1992a); here, the main focus is on the students' interpretations of these matters. In this respect, the question is more of a phenomenographic interpretation than simply of the theme itself. Naturally, the students' interpretations and appreciations have to be taken into account when replicating this kind of e-mail sponsored learning environment.

The next subdomain dealt with young people's hobbies and interests. As spending one's free time is closely connected to this subdomain, they will be discussed together. In School A, both boys and girls had a positive impression about these subdomains. Few students expressed critical or non-committal opinions. The girls obviously seemed more impressed, they gave more details and generally used more positive words and qualifiers than the boys. One of the general conclusions was that most of the hobbies seemed to be the same. One of the girls (School A) put this observation like this:

> "Same kind [of hobbies] almost around the world, but it was cute to exchange comments."

Only collecting sneakers (cf. Tella 1992a, 103) jumped out of the ordinary, as mentioned by one boy.

Teacher B's students were rather reserved concerning hobbies and free time. Skating and computer games were mentioned, but generally the hitch was that most English students were significantly younger than the students in School B, so they did not have that many hobbies or interests in common. The negative influence of the difference in ages was of course realised even during the fieldwork period and there was a conscious effort in School B to take advantage of other incoming materials as well. Obviously, however, in the students' views, those messages coming directly from the English partner schools were considered more essential than others.

As for Teacher C1's two forms, the students' opinions were again rather extreme: from everything to nothing. However, the majority seemed to have gained at least a little concerning these subdomains. All in all, the students' written evaluations seemed somewhat more critical than their oral reports during fieldwork, especially when compared with observations I made while in class with them. One of the problems probably was that the questionnaires were rather long and called for concentrated, analytical answers to many issues. There probably was some degree of fatigue among Teacher C1's students with respect to answering all the questions properly. On the other hand, it can also be assumed that the students were fairly honest and sincere when writing down their impressions.

Also Teacher C2's students had learnt something about their foreign partner school students' hobbies and interests and one of the boys even wrote that this theme had been up quite substantially. One of the girls reported: "It was nice to know." Besides, when compared to the large number of excellent contributions produced by the Finnish students in regard to descriptions of their hobbies and other interests (cf. Tella 1992a), the students' own opinions about this activity are rather modest and succinct. On the other hand, naturally, from the students' point of view, it was more captivating to write and read about these hobbies than analyse the impressions the process produced in them.

The third major subdomain in Question 12 was concerned with culture. Culture, as a concept, is of course rather vague and could lead to misunderstanding. However, while Questionnaire 2 was administered, no questions were asked concerning what culture in this context was meant to imply. It was my wish to have the students to interpret it as broadly as they needed to, including various aspects of civilisation as well. This did not seem to become a problem at all. The students' answers reveal that they included quite a number of things in the concept of culture, starting from cuisine and recipes to general knowledge of a foreign country and to different measurements (both inanimate and human). Habits and customs were among the most often cited. In School A, two boys had not had any special information concerning culture:

> "0?"
> "I have not got any special information".

Only one girl was hesitant ("Yeah..."). The School A boys' answers included these kinds of responses:

> "I've had information on other countries"
> "Very little"
> "Little"
> "The English still use different measurements, yeah..."
> "Got extra information"
> "Information about them"
> "Information about the young's systems"
> "Something".

The School A girls, on the other hand, were slightly more specific. Some examples:

> "Their food culture"
> "To some extent"
> "They could have told more"
> "Recipes"
> "Differs to some extent"
> "I got information about how young people live in New York. Interesting"
> "Got information about personal habits"
> "You get additional information"
> "More information about culture in other countries"
> "General knowledge"
> "Small pieces of information"
> "How different people are, about émigrés".

In Schools B and C, the comments were more succinct. In School B, only three boys commented on this topic:

> "Nothing"
> "New information"
> "The school world".

Not more than three girls expressed their views on this subdomain:

> "I got information about the English school culture and computer-assisted learning over there"
> "Nothing"
> "A little".

Teacher C1's two forms only gave a couple of answers, most of them rather negative. Two of Teacher C2's boys wrote as follows:

> "One has learnt something new out of every subdomain"
> "Nothing".

Three girls of Teacher C2 commented on this one, all of them most critically, stating that they had learnt nothing new concerning foreign cultures.

The critical comments on the role of culture need some further analysis. Obviously, this subdomain should have been explained more carefully to the students. It seems to me that the students probably slightly misunderstood its meaning after all. What might have interfered was the fact that in the official curriculum (Anon. 1985) there is a special course on culture (Course 6), which is studied at the end of the second year. Culture in this sense may be associated in the students' minds with literature, arts, theatre, and opera, among other things. These aspects, admittedly, did not play a decisive role in the fieldwork period. Some of the problems connected to culture have already been discussed (Tella 1992a, 143—146 & passim). As I pointed out earlier (Tella 1992a), cultural awareness towards foreign countries and their civilisations was most probably heightened, even manifesting itself in various forms of art and written production, but as a theoretical concept, its implications may not have been that evident to the Finnish students. This contradiction between what had been done in a most artistic way and the concept as such may explain part of the paucity of commentary notes on this subdomain.

As to music, the same basic difference in responses between School A and Schools B and C continued. School A (Teacher A's two forms) commented on this subdomain more positively than the other classes. The basic remark made by several students, both boys and girls, concerned the fact that young people's musical taste is rather homogenous; the same bands and stars appeared to be in vogue both abroad and in this country. Not many comments specified details, however. One of the boys (School A) admitted he had profited quite a lot from what the foreign students had written and added that "there are a lot of rap-men in New York". Only one irrelevant comment was made (by a boy in School A):

> "My pal kept on whistling while I was writing on the micro."

One of the girls in School A had realised what I would call a basic truth when speaking of music and taste, i.e., knowing more about young foreigners' music choices enlarges one's own taste of music. In other words, one doesn't have to like all sorts of music but one can always widen one's knowledge of other people's tastes.

Question 12 also gave the students an opportunity to add something more personal to their responses. In School A, there were five extra comments, three of which by the boys:

> "Can't recall anything special"
> "I have noticed that a good idea can be spoiled by poor arrangements"
> "[I became] enthusiastic about typing with 10 fingers".

Two girls in School A commented on something extra:

> "Planning letters etc. sometimes regrettably took a lot of time available at home"
> "In general, more information about other people".

In School B, one girl asked for something else, viz. for art. As to Teacher C1's students, none wished for anything else. One boy of Teacher C2's wrote that "one has learnt something of every subdomain" and one girl hoped to know more about the English school. When compared to the fairly rich collection of new ideas presented spontaneously during fieldwork, answers to this question gave a slightly poorer picture of the students' imaginative powers. This, however, demonstrates the fact that tri-angulation (cf. e.g., Denzin 1978; Erickson 1986) in its various forms is quite useful when providing information about a real school context. If the students had been asked these questions uniquely by post without my having also observed them in ordinary school situations, the results would have been quite different and more one-sided. Active participant–observation in classes shed extra light on the students' opinions and behaviour in many ways and helped me in my interpretations of what had taken place during fieldwork.

Question 13: *"In general, what do you think of the electronic link between your class and the English class now that the spring term is almost over?"*

This question was asked in order to give the students a chance to provide the researcher with their overall impression of the e-mail project they had been attending during fieldwork. On the whole, the students seemed to have taken this question more seriously than the end of Question 12, as there were significantly more responses and deeper analysis in their responses. In School A, out of 21 answers by the boys, there were only four critical or reserved standpoints:

> "Unnecessary; I didn't profit from it"
> "The teacher and the researcher have censored the mails impersonal, or then the English are like that, impersonal. Good idea"
> "Next to nothing. We should have had this much more so that all the students could have produced something relevant at least every two lessons"
> "I suppose this has interested some [students]; I myself have not been that much interested".

As can be seen, even these critical comments are not totally negative because they include positive closings. As to any censorship by Teacher A or myself, the student's hypothesis was wrong, because nothing was censored in incoming or outgoing messages (cf. however Tella 1992a, Chapter 7.2.1). The question of censorship practised by either the participating teachers or myself as a researcher may be linked to the issue of authorities in Perry's Map of Cognitive and Ethical Development (1981). By questioning the position of the teacher and myself the student reveals a shift from dualism towards multiplicity or relativism. As to the girls in School A, the few non-committal responses were not categorical:

> "It would have been nice to have more messages"
> "Nobody has time in the summer; let's continue next autumn"
> "Exchanging letters could have been more active"
> "It didn't mean anything to me, but I reckon it was quite a good thing, anyway"
> "I dunno"
> "Not that many [incoming] messages".

A large majority among boys as well as girls hoped the e-mail project could be continued the following term (as it was, in fact). Some of the comments included also comparison of time and profit and the role of the printed learning material:

> "Takes time, otherwise good, better than New Deal [the textbook used in that class] (grammar remains aside)."

These kinds of comments can be interpreted according to Perry's Map of Cognitive and Ethical Development (1981) as steps taken towards the highest stage of commitment, where an individual believes in his deepest values but at the same time is ready to learn something new and is open to new suggestions. Obviously, this stage calls for an analytical mind, ability and readiness to go into metathought and to question one's commitment from various viewpoints.

The above comment, written by a girl in School A, also includes a point which has to be raised here. Obviously, in the eyes of some students, using international communications networks and e-mail in foreign language teaching takes time from something more traditional, which is regarded as more profitable and therefore more appreciated. According to the main results received through thematic and linguistic analyses (Tella 1992a), computer-mediated communication can and probably will become an important part of the foreign language teaching/learning process. It will then be substituted for part of the more traditional learning materials. It will then no longer be just a substitute for traditional patterns of learning; rather, it will be an integrated part of the learning process. Obviously this was not quite fully understood by the students during fieldwork.

As to School B, Question 13 generated a number of analytical responses from the students. Two boys' replies out of 8 were negative:

> "The link was unnecessary"
> "Rather meaningless".

The mark of the first boy was 6; that of the second boy, 5, so they both represented that category of students who had difficulty learning English. The rest of the boys suggested certain modifications, such as:

> "Getting familiar with the telecommunications system itself remained incomplete"
> "The link has become permanent in my view, action could be resumed next year"
> "It is good alright"
> "Worth resuming though there are things to be ameliorated".

Some of the girls in School B were critical:

> "It didn't work properly"
> "Good, but the English students were too young..."
> "Well, nothing much" [a comment by a girl who got mark 4, i.e., failed at the end of the course]
> "Not very fruitful"
> "To me, not much benefit".

There were, however, more girls who thought positively of the project, e.g.,

> "It has worked out well"
> "Just cute"
> "The idea was quite alright. The [foreign] students could have been our age"
> "A nice experiment, but not a very enlightening idea"
> "Brought some variation to learning"
> "It was nice to write stories, but the feedback was not that special".

One of the best girls (mark 10) analysed the situation like this:

> "A good thing, but our English friends were quite young—at this age a couple of years is much!—and their texts, to put it bluntly, quite childish."

Another girl, mark 8, wrote:

> "As to our own school, I'd believe the e-mail was a success, but the messages (those few) arriving from England were thin information."

In sum, the age was again a decisive factor, and the girls had longer and more analytical replies than the boys. If compared to the student replies in School A, these students (School B) were roughly one year older and, perhaps, a little more mature as well. It may also be that the character of their teachers respectively had some influence on the students' behaviour. Teacher A proved very enthusiastic, active in trying out new things and open to even unorthodox solutions. Something of this enthusiasm might have been caught by her students. Teacher B, on the other hand, turned out more analytical and had a more serious approach to teaching and learning. It is quite possible that his way of teaching had already laid a mark on his students.

In Teacher C1's Form 2, the pros and cons were rather evenly divided. The boys thought that using e-mail was

> "A good idea"
> "Invigorating"
> "Nice variety, teaches the use of computers"

but also

> "A little dull"

and

> "I don't know; the connection is broken."

The girls found the e-mail link either

> "OK!"
> "It would be nice to go on next autumn"
> "Worked alright"
> "Just cute"

or

"Rather inoperational"
"Going on rather lazily"
"The English froze"
"No good..."

As to Teacher C1's Form 1, only three boys (out of 8) found positive features in the project:

"Quite good"
"Nice experience"
"It is quite a good gadget".

The girls' comments in Form 1 (Teacher C1) were surprisingly positive this time:

"Quite alright"
"Good job"
"It is good"
"Good"
"They are good"
"It was great fun"
"Good connections"
"It was a success"
"Quite good".

Only one girl answered nothing. As she had mark 10 in her school report, it must again be asked whether this high achiever was too aware of the cost/effectiveness factor and could not be bothered to work on something that apparently was not quite directly connected to everyday school work. The girls' more positive comments may also be in connection with their being more interested in writing than the boys, which manifested itself in the students' earlier experience in correspondence with foreign students.

Teacher C2's students also had positive attitudes towards the general profit of the e-mail project. This was slightly puzzling to me as it was these students who could not make full use of all the potentials the fieldwork period provided their teacher with. Only one boy was sceptical:

"Rather useless and powerless gadget."

The other boys commented on more positive lines:

> "Quite a nice experiment"
> "Just great"
> "Fairly interesting"
> "Nice job".

Two of the girls criticised the paucity of the incoming messages and the instability of the e-mail link, which was quite true regarding their class and part of the fieldwork period. Four others had found the use of e-mail quite entertaining variety, an easy and rapid way to communicate despite technical hitches in the e-mail link. One of the girls also wished the project could be continued later on.

Question 14: *"What things would you have emphasised more in the electronic link between your class and the foreign students?"*

Quite a number of students simply stated that they had no special emphases to add. In the following, only those points will be raised that contain a more specific view or include a suggestion. Most of these comments were ideas generated by the general framework of the project, like:

> "Perhaps more personal messages"
> "It would have been a good idea to have more messages from England"
> "More regular writings".

A bit surprisingly, quite a few students would have favoured student-to-student letters at a more personal level, although the value of these contacts is often denied in earlier research (e.g., Keep 1990). One boy (School A) wrote:

> "I would have liked to correspond with a person who does well in Maths or in Physics."

One girl (School A) refers to the initial difficulty of recognising English first names:

> "It would have been nice if one had had a penpal of one's own to whom one could send messages. Now we hardly knew whether we were writing to a boy or a girl".

Another girl (School A) also expressed her wish to tie permanent contacts with foreign students.

In School B, the girls were again more analytic than the boys. One of the boys tried to crack a joke:

> "In fact, we could arrange a meeting [with the foreign partner school students], on Reeperbahn, for instance."

Some more business-like wishes were also expressed by the boys:

> "To get closer to a certain group of students, with whom we have been corresponding"
> "More information about their musical taste as well as about hobbies"
> "Deeper cultural investigations: music, art, literature, etc.".

The girls wrote among other things:

> "It should be an exchange of ideas, regular activity"
> "How people think over there"
> "Young people's usual things, e.g., hobbies. English culture, etc.".

Several girls, once more, pointed out the age difference between them and the English schools. However, the students probably did not come to think that if all their foreign friends had been their age, the Finnish contributions might have looked a bit childish to some of the native speakers. The problem, then, might have arisen from the linguistic difficulty of the target language or maybe from lack of flexibility of expression, not only from contents.

In Teacher C1's Form 2, drugs were introduced by one of the boys, while the girls only wished for more activity and student-to-student stories. Among these students, there was an obvious lack of ideas, especially among the boys, a lot of the students did not answer this question or perhaps they felt they had already said the most relevant when answering the previous questions. Teacher C1's Form 1 was also rather taciturn. One of the girls wished more information could be received about different values in different countries.

Three boys in Teacher C2's Form 2 looked forward to accessing the computers more freely and to having time to write more messages between themselves and the foreign students. Only two girls commented on this point. One asked for more culture, the other wrote that she had got quite profound information at least from one foreign school but would have appreciated more information about their hobbies.

Question 23: *"How would you react to the suggestion that you would be given a chance to use e-mail independently next term to exchange letters with a foreign school?"*

The question, albeit a hypothetical one in the eyes of the students, was, however, quite seriously discussed in the participating schools. It is also a question that put the students into a position in which they had to analyse the degree of any commitment they would be willing to make. As explained earlier, the stage of commitment is the highest in Perry's Map of Cognitive and Ethical Development (1981) and involves the individual in deeper metathinking of one's choices and their influence on one's behaviour and even attitudes to be adopted. In regard to the students, this also calls for an assessment or balancing of their own mental and physical resources during the next school year. This question is therefore also connected to such classroom environmental resources as time and human energy (cf. Costa & Lowery 1989).

The question's latent significance lies in its challenge to make the students reflect upon their ability and willingness to balance several commitments, which may, when tentatively looked upon, seem rather contradictory (e.g., sticking to the traditional one is used to, adopting something new whose immediate utility cannot be guaranteed). The answers to this question were also assumed to give some direct feedback about how the students had experienced the working groupings used during fieldwork.

When analysing the answers, it must be borne in mind that boys generally do not correspond as much as girls, so this could hinder them from "volunteering". This was evidenced by the students' answers to Questionnaire 1 (Question 25: *"Have you been corresponding with a foreigner before?"*), which showed that about 80 % the girls (but only about 17 % of the boys) had had or still had penfriends abroad. Besides, on an average, the girls usually corresponded with almost three foreign penfriends, the boys only with one. Thus the Finnish girls had a lot more experience of traditional penpal correspondence with foreign students than the Finnish boys had. The girls probably also had been more willing to engage in exchanging letters than the boys, which apparently also gave the girls a better starting-point and more readiness to go on corresponding via e-mail. It must be added, however, that not all girls proved eager to exchange letters from the beginning. In Teacher C1's Form 2 there were a couple of girls (and a boy) who, at the beginning of the fieldwork period (on January 15th, 1990), were vehemently against any personal correspondence with foreigners, as these letters, in their opinion, would only include primitive and boring details about sisters and brothers, nothing more exciting. Later Teacher C1 emphatically pointed it out to me that these students had changed their minds as soon as they had received some student profiles from England.

In School A, out of 21 boys, six answered Question 23 in the negative. Nine boys were directly in favour of this kind of activity, and also the rest of the boys leaned towards the affirmative decision, e.g.,

> "I don't generally exchange letters, but this could be fun"
> "It could be fun if I just had time".

Out of 24 girls in School A, only two flatly refused. One of them said she would be scary about e-mailing so she would prefer to correspond by ordinary mail. To her, working via e-mail appeared robot-like! Sixteen girls adopted a clearly positive attitude to this suggestion. The rest were hesitant about the time available. One girl preferred group work.

In School B, the students already thought of the following year as their final school-going year and saw some problems in adding any extra activities to their ordinary school life. None of the boys liked the idea of corresponding independently via e-mail. One of them preferred group work. Another referred to little experience as an autonomous user of e-mail. Yet another stated categorically that he is not interested in correspondence. One boy couldn't say anything. Out of 17 girls (in School B), nine answered in the positive, for instance:

> "I'd love to use it"
> "I could try it just for fun"
> "It would be quite a nice thing"
> "GREAT!", etc.

The other girls said no, by referring to lack of time and to the coming final school year. One girl said she could not be bothered to do anything extra, which, perhaps, should be interpreted as escape from progressing through alienation (cf. McCreary 1990, 127).

As to Teacher C1's Form 2, out of four boys, two seemed to like the idea:

> "I would like that, it would enlarge my circle of friends"
> "I'd be super-happy".

Unfortunately, the last opinion had to be interpreted as irony on the part of one of the laziest boys. This is again an example of results achieved by combining two research methods, participant–observation and a written enquiry. If only a postal enquiry had been used, this reply would have had to be interpreted at its face value, i.e., as a most positive expression. Having observed the student in action and knowing him through participant–observation, however, justifies the above conclusion of irony.

Nine girls answered this question, five of whom said no, three were hesitant:

> "Not particularly interested"
> "No time"
> "I don't know".

Only one girl said she would have a positive attitude and would probably take part.

In Form 1 (Teacher C1), the boys' opinions were evenly divided; four boys either did not know or did not answer, four others answered affirmatively. Out of 10 girls, five were interested, one girl hesitated as she wondered whether she could do anything by herself. One girl thought she would not need this kind of activity.

Out of Teacher C2's five boys, two adopted a positive view towards this kind of correspondence, a third thought it would be better to do it in pairs, a fourth excused himself because of lack of time. Out of six girls (Teacher C2), three were readily in favour of this idea. Two others said they could think about if only they had time. The last one did not express herself.

Question 24: *"Any further comments? Please tell me freely any other ideas you find important for me to know."*

The last question provided the students with one more opportunity to express themselves freely. This opportunity was fairly widely utilised in Schools A and B, but only in a restricted manner in School C. Some of the students repeated their views already expressed, for instance, remarking that the e-mail project had given them some variety. In School A, two boys' comments out of 13 were critical, two others had no comments written in English, one wrote that he couldn't think of anything special. The rest of the boys commented on the possible continuation of the project:

> "The project could be continued"
> "The experiment has given a lot of variety to the language lessons and a chance to use more practical English".

They even wrote longer replies. One of the boys, for instance, replied like this:

> "It occurred to me that it would be interesting to have and see how you defend your doctoral thesis on this subject. Your profession must be interesting. Otherwise too, it would be cute to know how your research has progressed. [A further comment on my 'Thanks!' at the end of the questionnaire:] Handsome font!"

Another boy commented on the degree of freedom of the students in the practical e-mail situation:

> "Freedom would really be needed. It could contribute to increasing enthusiasm. Also, direct contacts would be nice. At the same time awareness of the practical uses of computers would be disseminated. I'd perhaps like to read your doctoral thesis. Good continuation!"

Two of the boys (School A), having worked as a pair, wrote a slightly enigmatic comment:

> "D' you know? The use of a Mac causes new kind of illiteracy (to the diskette)."

The girls in School A seemed quite content with the e-mail project. There were only two "No comments", while the rest of their comments (10 replies) pointed out some positive facts. Here are a few examples of the girls' comments:

> "It has been nice meeting you"
> "This experiment was great fun and activating in the middle of everyday hustle and bustle"
> "E-mail brought some variety to the grey school world"
> "It would be a nice thing to get in personal contact with somebody, like in traditional correspondence or then with more people"
> "Those letters were cute. Thanks!"
> "It is nice that international contacts are created"
> "Quite nice as an experiment".

One of the School A girls also commented on my French grammar book, even if it was in no way linked to the use of e-mail in this class. Perhaps, however, it shows the good *rapport* I believe had been created between Teacher A, her students, and myself.

In School B, only four boys wrote any extra comments. One of them hoped working via e-mail could be made more systematic; another commented that writing texts in a dedicated way takes a lot of time. Seven girls in School B had answered Question 24. One of them was a simple "Yeah, thanks a lot". One girl pointed it out that the project had not given her personally much. The rest of the comments were more personal. One of them wrote that

> "e-mail is a good idea, but exchanging letters calls for people of a same age, so that the exchange of ideas and stories would become interesting".

Another girl criticised the global approach:

> "In my view, the whole remained somehow fragmentary. I felt I could not have a proper touch to the thing. More lessons would have been needed in order to have better results."

One of the girls pondered upon the role of e-mail in the curriculum:

> "There was too little time for both ordinary studying of English and computers. E-mailing could perhaps be an optional subject."

Another girl resumed her feelings in a short line:

> "Thanks for an opportunity to experiment and have a nice summer!"

One of the most analytical comments was written one of the most proficient girls in School B:

> "The experiment, undoubtedly, brought with it pleasant variety, but it also took valuable time. During other English lessons, textbook chapters were browsed through in haste. [continued in English:] No good... [resumed in Finnish:] These kinds of experiments should not have unpleasant after-effects... But, on the other hand, they are useful too..."

The girl further refers to Question 12, in which she had written: "I got practice in writing and composing comprehensible texts." According to Perry's Map of Cognitive and Ethical Development (1981), it seems obvious that this girl had reached the stage of commitment, being able to make well-founded choices, seeing herself as an authority to judge what should be done and for what particular reasons.

In School C, the extra comments were scarce. In Teacher C1's Form 2, only three comments were written. The only boy hoped that any unorganised activity be stopped. One girl took the questionnaire for too long; the other had no comments. In Form 1 (Teacher C1), only four comments were provided. One boy did not like the questionnaire at all. The first of the three girls had no comments, the second wrote "Ciao ciao" and the third thought this was "a nice and useful thing!"

Even Teacher C2's students hardly commented on this question. One of the boys asked for more independent work. Three girls had written a comment:

> "Have a nice summer"
> "More advice"

> "Thanks for this programme; it offered nice variety to the English language lessons".

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In sum, when all these six questions are considered together, with a special view on any differences between the attitudes expressed by the boys and girls towards computers, e-mailing, and the use of communications networks, a couple of final explanatory remarks need be added. First of all, with respect to almost all questions, the girls provided me with more analytical comments. Second, they also clearly had more many-sided comments to express, which, of course, may come from their verbal fluency more than result from their preferences concerning computers as such. Third, almost all of the girls' replies were business-like, while a few boys had tried to crack a joke when filling out the questionnaire. Fourth, when expressing a critical opinion, the girls tended to motivate their views more frequently than the boys, who had more direct recourse to blunt statements. In terms of Perry's Map of Cognitive and Ethical Development (1981), it could be concluded, though with certain reservations, that some of the girls reached the highest level of commitment fairly easily. Quite a few opinions and views expressed by the boys remained at the levels of dualism (contrasted and unanalytical polarities) and multiplicity (atomistic, free-floating, arbitrary personal opinions). The stage of relativism (a state accepting the existence of irreducible uncertainty but yet acknowledging the possibilities of disciplined metathought) was reached in my view by quite a few boys and girls. On the basis of the data gathered, it is impossible, however, to conclude whether these differences are deep-rooted or whether the boys (or at least some of them) simply regressed to a lower stage through laziness or unwillingness to commit themselves to a mentally and cognitively more challenging stage which would have required more profound metathinking of their own mental and physical resources.

Apart from the above differences, it was not possible to tell the two sexes apart from each other on the basis of their responses. In both groups, some revealed positive impressions and experiences about the uses of computers, while others had a generally more critical approach to working with computers and to exchanging ideas with foreign partner school students via e-mail. The answers seem to reflect the individual students' attitudes to foreign language learning rather than their preferences to the use of computers in the foreign language teaching/learning process. This is most obviously reflected in answers to Question 23, which asks the students a hypothetical question about whether they would be interested in using e-mail on their own during the following school year. This kind of arrangement would naturally give more scope to person-to-person messages, without the students having to fear their teacher's or my interference with their exchange of ideas and commentaries. More girls than boys volunteered in this respect, appearing to be ready to commit themselves to a new kind of learning environment. In Perry's model (1981), the stage of these students would approach that of commitment. It must be borne in mind that the present e-mail project was based on a participative change cycle (Hersey & Blanchard 1985), which gives the students more liberty than a strictly coerced change cycle would have given. Some students found it natural to excuse themselves because possible lack of time, which during the final school year probably would have been a logistical problem to some extent. In Perry's terms (1981), this can also be interpreted as a way to postpone a movement towards a higher stage or simply as an escape through abandonment of new responsibility. On the other hand, this arrangement would have done away with one of the basic hindrances the students pointed out, i.e., the fact that they could not profit from personal correspondence as much as they would do in an ordinary exchange of letters. However, when boys and girls are compared in this respect, it can be concluded that in fact girls were more eager to make full use of the e-mail potential. It is highly probable that most of the students did not realise the number of different activities this kind of e-mail link would have put at their disposal (cf. conclusions in Tella 1992a; Tella 1992b). In the final analysis, however, it must be recognised that surprisingly good results were obtained from this enquiry which made the students do some disciplined metathinking regarding their own feelings, views, and opinions. At the senior secondary school level, the assignment calling for disciplined and analytical metathought can be considered quite a challenge, which most of the Finnish students, however, were able to cope with quite adequately.

5.4. Student Generated Disturbances

This chapter deals with part of the research problem area concerning achievability of aims and goals set for FL studying. It mainly focuses on intentional or unintentional disturbances caused by the Finnish students. These disturbances partly indicate the students' attitudes towards studying in an e-mail equipped learning environment. It has to be noted, however, that sometimes it is difficult to pinpoint the original cause of disturbance, because it may be concerned with general attitudes towards school-going or it may arise from the students' attitude to foreign language learning. Therefore disturbances observed during fieldwork may not necessarily be due to the use of international communications networks or e-mail; they may rather be due to general restlessness certain students manifested in the English lessons. However, the aim is to complement the picture scheduled through the student questionnaires and informal chats with them. The basic viewpoint of gender sensitivity and the possible differences between boys and girls is also built into this problem area.

A lot of the factors that disturbed ordinary studying or teaching were caused by unintentional acts by the students. These include behaviours like coming in late, not listening to teacher or other students attentively enough or restlessness caused by impatient waiting for the tests to be given back by the teacher. I call these unintentional as they tend to occur in other lessons as well and do not seem to be caused by mischief or intentional action by the students. Naturally, this kind of behaviour disturbed the teacher and other students to some extent. For instance, coming late often interrupted the English-language instructions the teacher was about to give. These kinds of disturbances were brought about by boys and girls alike.

In School B, one of the girls acted as chairperson of the students' corporation. She sometimes went away to do some particular assignment of hers. At least once (on January 24th, 1990) she also had a meeting with some other students in the middle of the English lesson, which evidently disturbed Teacher B and some of the students grouped near the students of the Union:

> "Some disturbance in the group, as the leader of the students (a girl) had an unofficial meeting with some others at the back of the lab, discussing the dates for a future students meeting." (A fieldnote in School B on January 24th, 1990)

On the whole, the conduct of this girl was a cause of disturbance during fieldwork. I later took a special fieldnote about her:

> "[H... P...]—one of the best students and chairperson of the students' corporation in this school—made a public announcement of some school festivity, in which she suggested the students would dress themselves as hippies. Later [Teacher B] remarked that it was a pity [this girl], being perhaps the best student and very innovative, had not co-operated very much during this spring. Somehow she had not been too enthusiastic about what the rest of the class had been doing." (A fieldnote in School B on Apr. 4th, 1990)

In sum, this girl could be called an isolate towards the rest of the students as far as e-mailing was concerned, as her individual level of connectedness, one of the communication structural indices (cf. Rogers & Kincaid 1981), approached nil, although she was obviously far from nonisolate regarding the overall relationships between the students of this class.

During a couple of other lessons in School B, some "extracurricular" activities were going on; several girls at the back row, while typing a story about Gallen-Kallela and Alvar Aalto, also seemed to read some personal letters and commenting on them between themselves. Another form of disturbing behaviour consisted of playing a computer game or a hand-held video game in class, while paying no attention to what other students were doing:

> "The heart disease group: the teacher told the boys that the text had been sent (...). They had a follow-up task: to compile students' records of cholesterol, make a chart of it and send it to Britain. I also asked them to comment on the limits of the scale and ask if the same figures are valid in British hospitals. The school nurse would probably take care of the measurements. One boy did not co-operate at all. He played with a game program. The teacher reminded him of the importance of co-operation, but with no visible result." (A fieldnote in School B on February 7th, 1990)

> "Form 1 (20 students) had been reading the German newsletter. The teacher had also given some anticipatory information about the project. The teacher also told me that he had been a bit annoyed that time because some of the boys had started playing games while the teacher had been demonstrating the e-mail system to the students. (...) The teacher was now going to lock the student computers till he would give them permission to work on them. The rest of the students had been fairly attentive, more attentive than Form 2 in early January." (A fieldnote in School C, Teacher C1, on March 5th, 1990)

We can also talk of intentional disturbance in cases in which some students tried to hide in a bigger group. They tried to make use of the big group in order to lurk in it, without bothering to work as conscientiously as the teacher would have appreciated. They simply could not be bothered to co-operate properly with others. I registered this in several fieldnotes, e.g.,

> "The backbenchers (a large group of girls) were a sort of a problem in the beginning. The teacher gently tried to have them divided into smaller groups, which finally happened. One of the girls went and switched another computer on and started writing about Gallen-Kallela (...)." (A fieldnote in School B on April 11th, 1990)

> "The poems group still consisted of too many girls; some of them kept on being rather reluctant to working as a team. This time, they started brain-storming on arts or culture--the new textbook was not yet available but the teacher provided them with spare copies of school magazines." (A fieldnote in School B on March 28th, 1990)

In Teacher C1's classes, some of the disturbances were caused by a number of boys acting too eagerly as "assistant teachers" even if they had not been asked to do anything. Most of these disturbances consisted of manipulation of the computer equipment in the computer classroom, for instance:

> "One of the boys, unnoticed by the teacher, went to the teacher's console, and turned the locking of the student computers off. Some of the machines were switched on, the teacher noticed this and there was a moment of confusion when the locking was switched on by the teacher again." (A fieldnote in School C, Teacher C1, on March 5th, 1990)

> "A few boys switched on the three brand-new IBM's (PS2/70). One of them quickly inserted his own diskette version of WordPerfect version 5.0, and showed it to some other boys and to the teacher. After

> seeing this, I advised the teacher to take up the question of providing the IBM's with this word processor." (A fieldnote in School C, Teacher C1, on March 5th, 1990)

> "The group of two boys went on tailoring WordPerfect 5.0. As I asked them what they had been planned to write about, they said nothing really. Yet the teacher pointed out to me that these two boys were among the best in the class (mark 10!)." (A fieldnote in School C, Teacher C1, on March 12th, 1990)

The behaviour these boys showed broke the ordinary *participation structure* usually respected during the lessons, i.e., the set of certain rules governing turn taking and other action in class (cf. e.g., Doyle 1986, 402—404). Besides, it was in parallel with Clarke's (1990, 61) argument that boys tend to dominate the most sophisticated computers accessible to a group of students. These boys apparently knew more than the rest of the students, and they found it compelling to try out some extra programme they had devised for themselves. In the final analysis, a working solution would have been to give them more autonomous assignments to do while the rest of the students went on working with their teacher. From Teacher C1's point of view, the boys' conduct was, however, unwanted as it was not directed towards the aims and goals of the e-mail project. The boys might have contributed more substantially to the project if they had been encouraged to install the WP 5.0 on the computers they preferred to use. From the gender sensitivity point of view, however, this might have increased computer access inequity, even if one of the three new microcomputers was still at the disposal of the girls of this class.

5.5. Initiative and Volunteering

In the preceding chapter, some disturbances caused by the behaviour of the students were pointed out. An opposite way of looking at the students' conduct is to find out what sort of initiative they had or in what ways and to what extent they volunteered to act for the common good. Positive initiative is to be noticed as contrasted to sheer response, i.e., a student's ordinary role. Initiative taking and volunteering also shed more light on how the students conducted themselves towards the e-mail project. In the following, a few examples will be shown to illustrate this point.

One form of initiative was shown by a girl who wanted Teacher C1 to correct a mistake in the number of students he had made in his letter sent to England. More often, however, the initiative taken by the student was to put forward a suggestion or to ask for permission to do something else. For instance, in Teacher B's class (on Jan. 24th, 1990), one of the boys came and asked if he could write something about Scotland, which otherwise would not have come up at all. Some of Teacher C1's girls volunteered to answer the Japanese letter for a happy school life. Similar actions could be seen during quite a number of lessons during fieldwork in various classes taking part in the e-mail project.

Sometimes, a group of students encouraged each other to take action along the lines set by the teacher. In School B, for instance, when the student profiles were being written, a number of girls told Teacher B that their profiles had not yet been finished but that they would do them in their leisure time, which seemed to take Teacher B by surprise.

The most consistent initiative was adopted by several individual students, most of whom were girls, who worked systematically throughout the fieldwork period, producing fine examples of autonomous writing, for instance.

> "During the process itself: the students had now prepared something in advance; some had typed a copy of their contribution (e.g., one girl had prepared an article on Finnish literature). She worked on her own, very hard and conscientiously." (A fieldnote in School C, Teacher C1, on March 12th, 1990)

> "As fifteen minutes still remained, some students wanted to start their job immediately. [Teacher C1] had not brought any diskettes with him, but the students helped themselves to some diskettes available in one of the teacher's cupboards on the side wall of the classroom." (A fieldnote in School C, Teacher C1, on March 5th, 1990)

> "Then one of the students [a boy named K...] asked when they [= the students on their own] could start playing around [Campus 2000 noticeboards]. Probably that would be the best way to do it. We joined Category 6—noticeboards. There we found, to some amusement of the students, very short and rather enigmatic notices written by British students. There was apparently slightly more interest in these notices than in the earlier ones. Teacher C2 didn't know one of the ab-

> breviations—neither did I—it turned out to be a pop band which at least one of the girls knew quite well." (A fieldnote in School C, Teacher C2, on Jan. 29th, 1990)

Sometimes the students also suggested changes to the times their messages were transmitted to foreign partner schools:

> "(...) the *feuilleton* group of girls: (...) they seemed to start with their second episode, which looked very promising to the teacher. When we were having lunch, one of the girls approached the teacher and asked that their contribution (i.e., the second part of their story) would not be sent right away; they would prefer to wait for some time to have the comments of the British students on the first part." (A fieldnote in School B on March 7th, 1990)

On some occasions, the whole class was intensely involved in writing e-mails, for instance, so that the arousal of level of interest was keenly felt by all the participants, teacher, students, and myself alike. The following is part of my fieldnote in School A in January 1990, depicting the process of students' writing messages with pen and paper, having them briefly checked by Teacher A or by myself, and then typing their e-mails on to diskettes in a variety of sites in their school where the students were working, also in the teachers' common room in which one of the computers was located:

> "More and more dyads arrived, many of them typing their letters on the IBM so that everybody worked one extra hour. Overtime! A certain degree of excitement. (...) In the common room, (...) active participant-observation." (A fieldnote in School A on January 22nd, 1990)

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Overall, the degree of initiative taking and volunteering evidenced in the four participating teachers' classes demonstrate in my opinion that some of the students were at least in times deeply involved in the process of computer-mediated communication and wanted to do more than the usual lot of an average student.

A special case among the students were the few key informants, especially in Schools A and B. Key informants, as defined by Zelditch (1962), do not only possess a lot of knowledge about the field under study, but are also willing to share their knowledge, opinions, and views with the researcher. In School A, one of the boys, turning out to be my best key informant, was extraordinarily competent concerning all kinds of computing activities. He was equally interested in learning English and was given the highest possible mark (10) at the end of the spring term. He was also asked by Teacher A to give special advice and even to transmit some of the completed messages via e-mail. This boy of 16 was also keen on discussing new ideas with me. In Schools B and C too, Teacher B and Teacher C1 made several references to some students, who excelled in computer skills. These students were constantly relied upon by their teachers when something unexpected occurred. Teacher C1's students gave him a hand, but not always as spontaneously as could have been expected. Teacher C2 also turned to one of her students when needing special assistance in the transmittal of e-mails. On the whole, these students were given more freedom to browse the e-mails on their own, which confidence did not prove unfounded.

6. Credibility

As in the two earlier reports (Tella 1991; Tella 1992a), this chapter is concerned with issues of credibility, mainly as seen from three perspectives, *validity, reliability,* and *generalisability* (cf. e.g., Goetz & LeCompte 1984; Jussila 1992; Lincoln & Guba 1990; Mäkelä 1990, 53; Suoranta & Eskola 1992; Tynjälä 1991, 130), but at the same time taking into account the generic character of this research. The main aim is to have a final, evaluative look at certain aspects of the methods used and the ways adopted for the analysis of the data gathered during fieldwork, in order to also give the reader a possibility to reflect upon the main problems as seen by me.

The interpretations and conclusions presented in this report concerning the Finnish students' personal preferences, viewpoints, and beliefs, are partly derived from the written answers provided by the Finnish students with the aid of the student questionnaires administered and filled out during fieldwork. These interpretations are, however, complemented with observations made by me in class as a participant-observer. Some of the students' commentaries are also mirrored against how their own teachers analysed the same situation. This kind of tri-angulation, in the process of both gathering the data and analysing them, gives rise to careful reflection. The administering of the questionnaires is always somewhat problematic, especially if the main focus of research lies on action, rather than on reflection itself. However, in the present research project, questionnaires were not administered as the only means of gathering data. They were not sent to the students by someone they did not know at all; on the contrary, they had got used to my presence in the lessons of English during fieldwork, so they knew whom they were answering. The answering situation was also made as peaceful and trustworthy as possible. The questionnaires were administered by the students' own teachers, as I assessed they were fully involved in the project and would like to find a proper timetable in their schedules for this operation. The questionnaires were filled out in ordinary classrooms (the students' own subject classroom) so that any distracting effect of the presence of computers in the computer labs could be eliminated. Besides, the questionnaires were easier to fill out in ordinary classes. Thanks to this kind of situation, I could argue, I was given quite honest—and also quite direct—feedback, which would invariably add to the whole of credibility of this study. Some of the students did not like my idea of asking their names as well. This detail was discussed between the participating teachers and myself at the beginning of the project, and they saw nothing extraordinary in this and encouraged me to ask the students' names. The main aim was to be able then to go on with personal interviews if they were thought necessary. Administering the second questionnaire fell through in one the classes (Teacher C1's Form 1), as this class participated only in one study period and was not accessible towards the end of the school term. Yet Teacher C1 managed to have these students to fill out the questionnaire at the beginning of the following school year. Understandably, however, the students had already forgotten some details, which lowered the reliability of their answers. One could also argue that maturation (cf. Goetz & LeCompte 1984, 222), usually depending partly on the intercorrelation of the social change and individual growth, was slightly more prominent concerning these students. Not all students returned their questionnaires and not all of them answered each question. However, in this respect, it was thought their answers reflected better their general attitude to the fieldwork period. No obligation to answer was enforced or coerced on the students. A certain degree of *rapport* between the students, their teachers, and myself could be interpreted to have existed, on account of some joking or more intimate sort of replies in the questionnaires, even if the students were aware of all the answers being identifiable thanks to their names.

There is a general threat to credibility when attitude questionnaires are administered, i.e., whether the students' attitudes as they describe them exist *before* the questionnaire or whether the questionnaire itself, and the mental reflection and metathinking generated by the process of filling out a questionnaire, in fact contribute to solidifying these attitudes and making the student conscious of them. Brown (1988, 35) refers to this threat as a *reactivity effect*, which may occur when the treatment causes a change in the subjects. Brown (1988) concludes: "One example of this effect might be an attitude questionnaire, in which the subjects actually form or solidify attitudes that they did not have before filling out the questionnaire. In this instance, the questionnaire becomes the catalyst for the very attitudes that are being studied. This effect would obviously influence, to an unpredictable degree, the results and the interpretation of the results." (Brown 1988, 35)

One of the threats to the questionnaires in this study is related to the fact that students were asked to answer the questions individually, even if they had mainly been working in pairs or in small groups during fieldwork. The main principle of grouping was based on self-selection (cf. Tella 1991) and on friendship, so grouping was not done on a cognitive-based level but rather according to social ties. Consequently, one could ask whether this affected the obtained results in one way or another. Some of the answers showed that a number of students, boys in particular, had been exchanging ideas while filling out their questionnaires. This became evident as a few exceptional ideas came up in two separate answers. To my mind, this did not, in the final analysis, have a substantial effect on the quality of the answers, as the individualised replies only occurred in free questions (like Question 24). Answering in pairs or in small groups could not be thought of, as regroupings took place from time to time. Besides, several students worked autonomously during at least part of the fieldwork period.

A real threat to be considered consists of the subtle differences between attitudes (*asenteet*), attitude-adoption (*asennoituminen*), and preferences (*mieltymykset*). In addition, even if the questions to be asked were focused on computer-mediated communication and the use of e-mail during fieldwork, it was not possible to keep apart students' general attitudes towards school-going or towards the learning of English as their first foreign language. Attitudes are generally considered rather permanent, slow to change, at least rapidly. People can, on the other hand, adopt a certain attitude towards a new phenomenon, such as a technological innovation and change this kind of attitude quite unexpectedly if the outcomes do not meet with prior expectancies. Preferences are the least immobile of these three. One could even say that preferences come and go. It was clearly seen in the behaviour of Teacher C1's two girls and one boy, who first most emphatically objected to having to correspond with foreign students—their preferences lay elsewhere. Nevertheless, as soon as they received interesting enough materials from Britain, they changed their minds and started preferring this kind of electronic correspondence to some other activities in class.

When speaking of attitudes and preferences, it is not only the target that counts, but also the means. Senior secondary school students are experienced learners, quite aware of what they can accomplish with those tools they are familiar with. Introducing new tools, such as a word-processor and the use of e-mail, and new audiences (instead of just writing to their own teacher of English) may give rise to a certain conflict of motives that the student cannot or will not solve then and there. This may lead to rejection of the new tools. Even those who first accept modern technology and find it superior to older means of communication, may regress back to old tools and old methods of work on account of fatigue, stress, poor general school success, etc. In the present study, analysis of the students' attitudes and preferences could not be extended to explicate all these aspects of this complicated research area, so they were ruled out. This deliberate decision can be defended for reasons based on time, money, and the resources available both at schools and for analysis of the data. Besides, this study project was described as exploratory, aiming to lay the groundwork for subsequent research and to provide the researcher with a new understanding of the research target (cf. e.g., Hämäläinen 1987, 12; Uljens 1989, 53). This latter viewpoint is further reflected in the choice I made concerning the full use of all the students' questionnaires, of which the latter (i.e., the second) questionnaires are analysed in detail in this report and interpretations are mainly based on them. This is motivated by the general belief that when something new is launched, first reactions to it are positive as it represents some kind of variety to the usual everyday work. Afterwards, the opinions become more stable and finally reflect the individual's inner feelings more accurately. For this reason, the second questionnaire is focused upon, even if it includes somewhat more negative or reserved stand-points than those recorded at the very beginning of the fieldwork period. For future action, this decision feels more justifiable, because it is more likely to give a more neutral and objective picture of how the students felt the use of modern technology was adopted for their good in the teaching/learning process as far as English was concerned. The first questionnaire was important, however, as early as the beginning of the fieldwork period, as it re-routed some of the class activities.

When students are studied, one aspect of validity, viz. that of *face validity*, has to be considered separately. Face validity expresses how justified and comprehensible the non-experts taking part in the research project (students, their parents, among others) consider the questions asked or the measures taken during the fieldwork period. It is the researcher's task to select the questions to be asked and to decide what sort of layout the questionnaire will have. All these decisions affect the students' behaviour and eagerness or sincerity to answer the questions. This threat was taken into consideration in several ways in this research. First, the layout was designed to be clear, fairly appetising with a number of logos, different font sizes, bold-face characters, etc. All the questionnaires were personalised to be used in one particular class only. The questionnaires were also printed on light-coloured sheets of paper. The colours (not reprinted in this report), were selected through the recommendations based on the theory of suggestopedia. More importantly, several questions included open endings, which were used to encourage the students to speak up as freely as possible. In the final analysis, the effect of these measures cannot be studied, but there were a number of student reactions which showed to me that at least some of them had been influenced positively by these rather subliminal steps.

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In this research project, the data gathered have been analysed from various perspectives. The first report (Tella 1991) concentrated on several aspects, including the role of the researcher and the general replicability of an ethnographic multi-site research. It also analysed the framework factors of a communication network, the indices of the communication structure, and the primary concern of interpretive research, viz., particularisability, while stressing the project's developmental character. The second report (Tella 1992a) mainly dealt with topic choice and linguistic analysis of the language used in e-mail communication, i.e., the data seen through themes and topics, and viewed in terms of applicability or transferability to new learning settings. This third volume is mostly based on the Finnish students' views and opinions about how the fieldwork period was carried out. These different perspectives are intended to reduce threats to internal reliability, which may be lowered by the fact that in retrospect, even the participants who have shared the same experiences, often analyse those experiences in a different way (cf. e.g., Romiszowski & de Haas 1989). Looking at the same phenomenon from and through various perspectives helps to create a global and more balanced picture.

What these three reports have in common include several features closely connected to the issue of credibility. One of them is *logical generalisability* (Hamilton 1980; Syrjälä & Numminen 1988, 175), according to which the reader is invited to draw his own conclusions and to assess whether he can apply the research findings to his own field of research or level of teaching. As the research findings reported in these three volumes are based on a case study -type research setting, it would be wrong to generalise that they are applicable or generalisable to all Finnish senior secondary schools; in other words, ecological validity or repeatability as such is low. Rather, the research tradition on which this research is based helps me conclude that the observations made through an active participant-observation, among other techniques, and the interpretations and conclusions built on these observations depict in all probability something essential to be derived from the use of international communications networks and e-mail. Therefore, regarding external validity, generalisations to be drawn from the research findings of this research project are expected to be argued along pragmatic guidelines—the results gathered into these three research reports will hopefully lead to new adaptations of the model built, and in turn to new interpretations of applicability of computer-mediated communication and e-mail in the teaching of foreign languages in Finnish senior secondary schools.

Another feature characterising this research project is the question of "polyphony", which is often preferred in ethnographic research reporting to the exclusive "I-witness" perspective of the researcher (cf. Geertz 1988; Hess 1989; Johnston 1990). For the purpose of achieving a more "polyphonic" tone in these reports, observations and comments made by the teachers and students alike are cited. This is done in all the three reports by extensive selection of both low-inference descriptors, such as word-for-word quotations, and high-inference conclusions (written-up commentaries, analytical after-thoughts, etc.). A well-balanced presentation of these two kinds of commentaries are recommended by many researchers (cf. e.g., Croll 1986; Erickson 1986; Fetterman 1989; Pfaffenberger 1988; Richardson 1990; Wolcott 1990).

Another attribute these three volumes have in common is a constant recourse to a *modus operandi* perspective (Scriven 1974), which refers to tracing the genesis of the data gathered via retrospective analysis, for instance by chatting with participating teachers and students. Retrospection may also be focused on any conflicting information obtained through various means of data gathering. In this third report, for instance, as indicated earlier in the chapter on Results and Interpretations, my attention was drawn to a certain conflict between what I could observe in class, analyse through a video recording in comparison to what the same students had written in their questionnaire. A *modus operandi* perspective, when combined with tri-angulatory approach to the research problem areas, may shed more light on the problems than the use of one particular data gathering technique, like a postal enquiry, possibly can. Another positive consideration is that this kind of combination is likely to contribute positively to the reliability of the research.

Yet another common feature is the fact that when reporting any research findings, then, an active participant–observer must also analyse his own behaviour, opinions, frustrations, and reactions as well (cf. e.g., Goetz & LeCompte 1984; Lincoln & Guba 1990), for which an effort has been made in this report too. Finally, credibility can be mirrored against the research findings, results, interpretations, and recommendations of the research project. This aspect is linked to pragmatic questions, such as "What can the results of the research be used for?" Questions of this kind will be dealt with in the following chapter.

7. Discussion

7.1. Discussion on Gender Related Topics and Student Attitudes

Discussion in this chapter will be focused upon certain aspects of the general theme of this report, by linking the research findings reported at the beginning of this volume to the analysis of data gathered during fieldwork and further to the results and interpretations of these data. The general theme of this report—boys, girls, and e-mail—include, among other things, gender sensitivity, computer access inequity, and any differences in attitudes or preferences between boys and girls. Dealing with these themes is highly motivated for a number of reasons. First of all, it is motivated by the fact that issues of equity/inequity, equality education, and equality thinking have become more important than before. They are not simply concerned with access to education—in fact, in this country roughly 57 % of the students at the senior secondary schools are girls. Rather, the question is about how the two genders react to the introduction of modern applications of Information Technologies into the teaching/learning process of a number of school subjects. Behind the research questions in this research project also lies the wish to find out whether the two genders can fully benefit from modern technology, especially from hardware and software connected to computer-mediated communication and to the use of e-mail. This research project represents a developmental research, whose aim is to develop the working environment of the students from the point of view and for the common good of all those involved, teachers and students alike. Issues of gender sensitivity and computer inequity also concern both teachers and students. In this report, the main emphasis has been laid on studying the views, opinions, and preferences of the students so as to find out what can be done to balance the situation or to do away with any conflicts between the two genders.

Part of this study was concerned with whether boys or girls showed any fear or anxiety about coping with new Information Technologies. It was found out that some students, both boys and girls, preferred to have the support of a dyad or a small group, while others would have appreciated autonomous work and freer access to the e-mail system, thus looking for complete individual connectedness.

The students reacted to the e-mail project in various ways. The opinions and views expressed in the student questionnaires were not all completely positive. Those who had reservations or put forward direct criticism also often made suggestions for modifications. Some of the critical feedback was obviously due to inexperience to use new technology and to low communication proximity evidenced in times between the Finnish participating schools and their foreign partner schools during the fieldwork period. It can be concluded that the students did not quite grasp all the potentials accessible to them via the international communications networks and the number of different activities computer-mediated communication could have put at their disposal. Some of them obviously did not quite realise that the incoming e-mails represented information which was to be further worked on, to be edited and used in a class or school magazine or for their personal enlightenment.

In the analysis of the student questionnaires, the girls provided slightly more analytical and business-like comments than the boys. Even when expressing a critical opinion, many of the girls attempted to motivate their views more frequently than the boys, who often contented themselves with more atomistic or blunt statements. Excluding these differences, it was not possible to tell the two sexes apart on the basis of their responses. The answers seemed also to reflect, at least to some extent, the individual students' attitudes towards foreign language learning in general rather than uniquely their preferences to the use of computers in the foreign language teaching/learning process. More girls than boys appeared to be ready to commit themselves to a new kind of learning environment.

7.2. Conclusions and Recommendations

In the following, a number of conclusions and recommendations will be presented. It is up to subsequent research to verify whether these conclusions can be applied to boys and girls in larger contexts in the Finnish school settings.

In order to prevent any computer inequity at the senior secondary school level, computing should be incorporated into the school curriculum at a sufficiently early age. In the Finnish school context, this refers to the lower level of the comprehensive school. Considering the changes about to take place in the Finnish curricular development (cf. Anon. 1992), this viewpoint will probably be taken into account.

When computer-mediated communication is introduced into the teaching/learning process of foreign languages, enough attention has to be paid to what boys and girls best master in computing. The present research showed that boys access more computers at home, play more computer games than girls, and perhaps also enjoy computer simulations better. Girls, on the other hand, have a wider prior experience of writing activities, such as correspondence with foreign students and are probably more accustomed to coping with word-processors and the keyboard. This different kind of expertise of the students should be put to many-sided use in FL classrooms. There is, however, some evidence that certain features of e-mail enhance forms of writing, viz. chatting, informing, and entertaining, which are not usually practised in teacher-sponsored school-based writing but which may empower boys as well. Another consideration is that as soon as electronic information retrieval, storing, and manipulation starts playing a more significant role in computer-mediated communication, these activities appeal to both genders.

In the present study, boys and girls worked in one-sex groups only, even if groups sometimes collaborated loosely. *From the point of view of computer-mediated communication, it would seem more appropriate to form mixed-sex groups, in which boys' expertise of and interest in hardware could be fruitfully combined with girls' better skills to manipulate the word-processors (text-processors) and their ability to create and exchange ideas in writing.*

Both boys and girls should have more direct access to the computing resources of their schools and to the use of e-mail as a tool. Were this principle accepted, computers should no longer be concentrated and locked into special computer-equipped laboratories; rather, they should be installed in several locations in schools, especially to be used by several school subjects. This would necessarily mean more computer access equity to boys and girls alike. At the same time, it would give more scope for the teachers as they could also access a computer more independently irrespective of the hourly allocations of a computer laboratory. At the school level, this may mean a new kind of computer access policy towards the use of modern Information Technologies, even in non-class time.

Computer-mediated communication and e-mail increase the use of computers as tools. According to both earlier research findings and to the present research, this is regarded as particularly useful by the girls. Besides, the use of computers as tools is not sex stereotyped; rather it is gender-neutral and therefore contributes positively to equality education by lowering gender inequity problems and by changing attitudes. Besides as computers give the same kind of information channel to both genders, it is likely that it will lower any gender inequity in this respect.

E-mailing can also have a democratising influence on dominance or power relationships in class, as it gives equal opportunities to shy or slow students to have their say in the classroom dialogue. Computer use like this is also expected to integrate computer-mediated communication into the FL curriculum in Finnish senior secondary schools.

Computer-mediated communication and e-mail need be understood as a useful and instructional form of activity which helps students in their studying and which will replace part of traditional teaching and which will gradually become a relevant part of the teaching/learning process. A lot has still to be done, though, as senior secondary school students—both boys and girls—are quite conscious of the cost/effectiveness of their studies. The question is of a qualitative change, including new and reformed ways of work, new kind of material access, and new kinds of opportunities to work on electronic and telematic information. In regard to methods of work, this would mean that more collaborative work is initiated within classes, across classes, and, if the idea of a Virtual School is implemented, across a number of age levels.

The foreign language teacher's role is bound to change in the process of integrating computer-mediated communication into the FL curriculum. The new role of the teacher can be characterised as that of a consultant, a guide, a co-learner or a personal tutor. As girls tend to lean to the teacher somewhat more heavily than boys, in an open learning environment in which modern Information Technologies are at students' disposal, teachers have to give students more autonomy by encouraging them to make wider use of the potentials accessible to them. It seems obvious that computer equity and well-balanced gender sensitivity cannot be guaranteed unless positive female role models are given to students also by female teachers. As the majority of the foreign language teachers in Finnish senior secondary schools are female, this issue is of primary importance.

One of the most important conclusions based on the findings of the present research project is that both boys and girls can enjoy working in a learning environment focused on computer-mediated communication; they can become deeply committed to working in an e-mail-equipped environment and learn not only from each other in a co-operative and collaborative milieu, but learn from and interact productively with the computer. This also implies that computer-mediated communication can be incorporated into the foreign language curriculum as an integral part of it, which was one of the original aims of the present research project.

7.3. Further Research

When discussing the possibility of further research along the lines scheduled in the present research project, a couple of questions need to be asked. First, what sort of information was obtained from the data analysed? Second, what sort of new information will be needed in further analysis of the problems associated with the research problem areas of the present study? These two questions will be briefly answered below (for more detailed analyses of results and conclusions regarding the first two research reports, see Tella 1991, Tella 1992a).

The three reports of the research project started in 1989 now cover both the telematic and social structures of an international communications network. To sum it up, the first report (Tella 1991) introduced computer-mediated communication and the use of e-mail as a technological innovation into foreign language classrooms in some Finnish senior secondary schools. The first volume also aimed at defining the intrinsic attributes of e-mail communication. An international network of Finnish and foreign schools, teachers, and students was established on a DialCom compatible e-mail system and on the Internet. The establishing of the network started in the summer of 1989, and the network was fully functional between November 1989 and May 1990. Many of the links created during fieldwork are still operational when this third volume is being written. The second volume (Tella 1992a) adopted a human interest perspective, i.e., what were the participants—Finnish and foreign—talking about via e-mail and what sort of language characterised this communication? The present volume aimed at throwing some light on the views, opinions, and preferences of the Finnish students, mostly as seen through their answers to the student questionnaires. The questions of gender sensitivity and computer inequity were also discussed.

With respect to what kind of further research should be done in order to complement and, perhaps, to replicate the present research project, some of the directions appear quite promising and worth trying. First of all, as curricular development work makes progress in the Finnish school context, it would only seem natural to create more links between curricula and school applications of modern Information Technologies. It would also mean careful pondering upon new methods of work and classroom practices. From the viewpoint of computer access inequity, this kind of research should be focused upon the comprehensive school level as well.

From the gender sensitivity point of view, more attention ought to be directed to analysing what sort of software used in computer-mediated communication would be gender-neutral and not sex stereotyped and what kinds of programs would be of most use to boys and girls alike. Interesting developments are taking place in the area of text-processing software tools, for instance, including spelling checkers, thesauruses, readability and style analysers This kind of research would fruitfully combine boys and girls' tendency to favour different kind of computer software and could utilise their respective skills in computing. It would also help to find out what sort of software could be used as tools in the FL teaching/learning process. Fundamentally, the question is about what sort of computer programs would be likely to empower each gender and, consequently, to contribute to enhanced learning.

As far as software is concerned, another direction to be followed concerns the use of computer programs specially written for qualitative analysis (cf. e.g., Lee & Fielding 1991), which undoubtedly will have a strong influence on data gathering and data analysis in the near future.

Further research would at its best be conducted on issues contributing to better comprehension of how computer-mediated communication can act as a democratising instrument regarding power relationships in FL classrooms and therefore for the sound and well-balanced development of students' personalities. This would include all aspects of a communicative language proficiency, all the four language skills (reading, writing, speaking, and listening), but it would also suggest new initiative towards inter-cultural or cross-cultural analyses.

By and large, further research should be directed to linking technical developments into a working foreign language teaching/learning environment, in which both students and teachers can find enough scope to operate. This could mean a strong emphasis on the ideas epitomised so far within the concept of a Virtual School.

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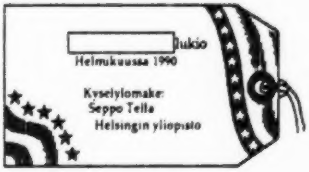
Appendices

Appendix A
The First Finnish Students' Questionnaire (Jan.—Feb. 1990)

Pyydän Sinua täyttämään kyselylomakkeen mahdollisimman huolellisesti. Se auttaa suunnittelemaan projektiamme eteenpäin. Rengasta sopiva vaihtoehto tai vastaa pyydettäessä vapaamuotoisesti. Käytä tarvittaessa paperin kääntöpuolta.



Nimesi: ______________________ (etunimi – sukunimi; tekstaten!)

1. Oletko tyttö vai poika? tyttö / poika
2. Kuinka vanha olet? _______ vuotta
3. Mitä kieliä opiskelet lukiossa? (Tarkista ja täydennä.)

A-kieli: englanti	B-kieli: ruotsi	C-kieli:	D-kieli:

4. Oletko osallistunut englanninkielen kursseihin englantia puhuvassa maassa? (Jos olet, missä maassa/maissa ja kuinka monta viikkoa?)

5. Oletko oleskellut englantia puhuvassa maassa muussa tarkoituksessa kuin osallistumassa kielikurssiin? (Jos olet, missä maassa/maissa ja kuinka monta viikkoa?)

6. Luetko pitkää vai lyhyttä matematiikkaa? pitkää / lyhyttä
7. Onko sinulla mikrotietokonetta kotona? on / ei ole

Jos on, vastaa näihin kysymyksiin:

- Onko se omasi? on/ei ole
- Onko se veljesi tai siskosi? on/ei ole
- Onko se isäsi tai äitisi? on/ei ole
- Minkä merkkinen mikrotietokone se on?
- Kuinka usein käytät sitä?

- Mitä tietokoneohjelmia voit käyttää kotona? (Anna esimerkkejä)

Pelejä	Tekstinkäsittelyä
Sähköpostia	Jotain muuta? (Mitä?)

8. Kuinka monilla ystävistäsi tiedät olevan mikrotietokoneen kotonaan? (Minkä merkkisiä mikroja heillä on?)

9. Oletko pelannut tietokonepelejä tai muuten käyttänyt heidän konettaan heidän kanssaan? (Mitä pelejä? Mitä ohjelmia?)

10. Oletko voinut käyttää mikroa koulussa? olen / en ole
Jos olet, vastaa näihin kysymyksiin:

- Missä aineissa tietokonetta on käytetty?

- Mihin tarkoitukseen tietokonetta on käytetty?

11. Minkä verran olet perehtynyt tekstinkäsittelyyn tietokoneella? Mitä ohjelmaa olet mahdollisesti käyttänyt? (TEKOa? WordStaria? WordPerfectiä? Wordiä? MacWritea? Eskoa? Jotain muuta?)

12. Oletko kirjoittanut omia tai toveriesi/ryhmäsi suorituksia tietokonelevykkeeseen Englantiin lähetystä varten? Mitä ja minkä verran?

13. Jos voisit vapaasti valita, kummalla laatisit vieraskielen kirjoitelman tai äidinkielen aineen: mikrotietokoneella vai kynällä ja paperilla?

14. Miksi pidät parempana mikroa / kynää ja paperia?

15. Miten mieluimmin työskentelet kirjoitelmaa laatiessasi?

Yksinäsi?	Parin kanssa?
Pienryhmässä?	
(Perustelusi:)	

16. Luokkasi on saanut Englannista oppilaiden kirjoituksia. Mikä niissä on sinua erityisesti kiinnostanut?

17. Mitä mieltä olet oman koulusi ja Englannissa olevan koulun välisestä sähköpostiyhteydestä?

18. Mitä itse olet laatinut englantilaiseen kouluun lähetettäväksi?

19. Kun olet kirjoittanut englantilaista koulua varten,

paljonko olet työskennellyt yksin?	kuinka paljon parisi kanssa?
kuinka paljon pienryhmässä?	

20. Työskennellessäsi parisi kanssa tai pienryhmässä, minkä verran arvioit käyttäneenne englantia ja minkä verran suomea?

21. Millä perusteella pari tai pienryhmä pitäisi mielestäsi muodostaa? (Kielitaidon mukaan? Ystävyyssuhteiden perusteella? Arpomalla? Tietotekniikan taitojen perusteella? Jotenkin muuten?)

22. Miten arvelet itse hyötyväsi sähköpostiyhteydestä englantilaiseen kouluun? Arvioi esimerkiksi näitä osa-alueita. (Anna esimerkkejä.)

kieli	musiikki
historia	politiikka
kulttuuri	jokin muu?

23. Mitä asioita haluaisit painottaa enemmän englantilaisen koulun ja oman koulusi välisessä yhteydessä? Ehdota!

24. Haluaisitko, että sinulla olisi henkilökohtainen sähköpostiystävä Britanniassa tai jossain toisessa englantia puhuvassa maassa?

25. Oletko ennen ollut kirjeenvaihdossa ulkomaille?

Mihin maihin?	Millä kielellä kirjoitit?
Kuinka pitkään kirjeenvaihtoa jatkui/on jatkunut (suunnilleen)?	Vaihdoitteko myös kasetteja, videoita, levyjä tai postimerkkejä?

Kiitokset siitä, että vastasit tunnollisesti!

THANKS!

Appendix B
Translation of the First Finnish Students' Questionnaire

Senior Secondary School of XX, February 1990
QUESTIONNAIRE by Seppo Tella, University of Helsinki

Please fill in this questionnaire carefully. Circle the appropriate choice, or write a full answer to the question asked. You may continue your answer overleaf.

Family Name: __________ First Name: _________ (in block letters)

1. Are you a boy or a girl? Boy / Girl
2. How old are you? ____ years
3. What languages do you study in senior secondary school? (Check and fill up.)

Language A: English	Language B: Swedish	Language C:	Language D:

4. Have you attended English-language courses in an English-speaking country? (If you have, in which country/-ies and for how many weeks?)

5. Have you been to an English-speaking country for some other purpose than attending a language course? (If you have, in which country/countries and for how many weeks?)

6. Do you read long or short Mathematics? long/short

7. Do you have a microcomputer at home? yes/no
If you have, please answer these questions?
- Is it your own? yes/no
- Is it your brother's or your sister's? yes/no
- Is it your father's or your mother's? yes/no
- What brand is your microcomputer?
- How often do you use it?
- What computer programs can you use at home? (Give examples)

Games—Word-processing—E-mail—Something else? (What?)

8. How many of your friends do you know have a microcomputer at home? (What brand are their computers?)

9. Have you played computer games with them or otherwise used their computers? (What games? What software?)

10. Have you been able to use a microcomputer at school? yes/no
If you have, answer these questions:
- In what subjects has the computer been used?
- For what purposes has it been used?

11. How familiar are you with word-processing? What word-processor have you possibly used? (TEKO? WordStar? WordPerfect? Word? MacWrite? Esko? Something else?)

12. Have you typed on to a diskette contributions of your own or of your partners/your group to be sent to England? What have you typed and how much?

13. If you had a free choice, which would you prefer when writing a foreign language composition or a mother tongue essay: a microcomputer or a pen and paper?

14. Why do you prefer a microcomputer/pen and paper?

15. Which of these do you prefer when writing an essay?
On your own? With a pair? In a small group? (Why?)

16. Your class received a certain number of letters from England. What interested you most in them?

17. In general, what do you think of the electronic link between your class and the English class?

18. What have you written yourself to be sent to the English school?

19. When you have been writing for the English school, how much have worked on your own? With your friend? In a small group?

20. When working with a partner or in a small group, how much would you assess you used English and how much Finnish?

21. On what grounds do you believe a pair or a small group should be formed? (According to language skills? Friendship? Tossing a coin? Computing skills? Something else?)

22. What sort of personal profit do you assess you got from the e-mail link with the English school? Assess the following domains, for instance. (Give examples.)
Language—Music—History—Politics—Culture—Something else?

23. What things would you have emphasised more in the electronic link between your class and the English students? Suggest!

24. How would you react to the suggestion that you would be given a chance to exchange personal e-mails with a foreign friend in Britain or in some other English-speaking country?

25. Have you been corresponding with a foreigner before?
Which countries? In what language did you write? For how long did you correspond/have you been corresponding (approximately)? Did you exchange (have you exchanged) also cassettes, videos, records or stamps?

Thanks for answering these questions conscientiously!

THANKS!

Appendix C

The Second Finnish Students' Questionnaire (May—Aug. 1990)

Täytä kyselylomake mahdollisimman huolellisesti. Se auttaa analysoimaan parhaiten sähköpostikokeilua ja sitä, miten itse koit sen. Rengasta sopiva vaihtoehto tai vastaa pyydettäessä vapaamuotoisesti. Käytä tarvittaessa paperin kääntöpuolta.

lukio
Toukokuussa 1990
Kyselylomake:
Seppo Tella
Helsingin yliopisto

Nimesi: _______________ (etunimi – sukunimi; tekstaten!)
Luokka: _______________

1. Minkä verran olet tänä keväänä voinut käyttää *mikrotietokoneita* koulussasi?

   - Englannin kielen tunneilla

   - Muiden aineiden tunneilla? Mihin tarkoitukseen?

2. Minkä verran tänä keväänä käytit *tekstinkäsittelyä* englannin tunneilla?

3. Saitko riittävästi ohjeita siitä, miten *tekstinkäsittelyohjelmaa* käytettiin? Mihin asioihin olisit toivonut enemmän painotusta?

4. Mitä vaikeuksia koit tekstinkäsittelyssä? Mihin kohtiin mielestäsi pitäisi kiinnittää enemmän huomiota, jotta työskentely helpottuisi?

5. Jos voisit vapaasti valita, kummalla laatisit vieraskielen kirjoitelman tai äidinkielen aineen: *mikrotietokoneella vai kynällä ja paperilla*?

6. Miksi pidät parempana *mikroa / kynää ja paperia*?

7. Osaatko kirjoittaa *kymmensormijärjestelmällä*? (Jos et, kuvaile konekirjoitustaitoasi lyhyesti.)

8. Mitä *itse* laadit Englantiin tai muihin maihin lähetettäväksi?

9. Mitä ja minkä verran kirjoitit ryhmäsi muiden jäsenten suorituksia *tietokonelevykkeeseen* Englantiin lähetystä varten?

10. Kuinka paljon ja miten *suunnittelit* viestejäsi, ennen kuin aloit kirjoittaa niitä paperiin tai levykkeeseen?

- Mitä apuvälineitä käytit suunnittelu- ja kirjoitusvaiheissa?

- Mitä apuvälineitä olisit halunnut vielä avuksesi?

11. Luokkasi on saanut Englannista ja useista eri maista oppilaiden kirjoituksia ja viestejä. Mikä niissä on sinua eniten kiinnostanut?

12. Miten arvelet itse hyötyneesi sähköpostiyhteydestä ulkomaisiin kouluihin? Arvioi esimerkiksi näitä osa-alueita. (Anna esimerkkejä.)

englannin kieli	musiikki
nuorten harrastukset	vapaa-ajan vietto
kulttuuri	jokin muu?

13. Mitä mieltä olet koulusi ja Englannissa olevan koulun välisestä sähköpostiyhteydestä nyt, kun lukukausi on lopuillaan?

14. Mitä asioita olisit halunnut painottaa enemmän ulkomaisten koulujen ja oman koulusi välisessä yhteydessä?

15. Kerro *harrastuksistasi*. Mitä teet mielelläsi kouluajan ulkopuolella?

16. Mikä on *mieliaineesi* lukiossa? Mikä se oli yläasteella?

17. Nimeä luokaltasi *kaksi parasta ystävääsi*. Perustele, miksi valitsit juuri heidät.

18. Jos haluaisit työskennellä pitempään samassa kolmen hengen ryhmässä, joka olisi sähköpostiyhteydessä ulkomaiseen kouluun ja vaihtaisi viestejä noin kerran viikossa, kenet *kaksi* valitsisit luokaltasi tähän ryhmään? Millä perustein?

19. Kuvittele, että luokkasi tekee luokkaretken Englantiin tai Yhdysvaltoihin ulkomaisen koulun vieraaksi. Kenet *kaksi* valitsisit luokaltasi järjestelemään vierailua luokkasi puolesta?

20. Sähköpostikokeilumme onnistui eräissä suhteissa, mutta parantamisen varaa jäi. Miten *Sinä* olisit halunnut muuttaa kokeilun toteutusta? Arvioi ainakin näitä näkökohtia.

- Oman koulun työskentelytilat (tietokoneluokka, pääsy käyttämään koneita jne.).

- Saapuneiden viestien määrä ja laatu

- Lähetettyjen viestien määrä ja laatu

21. Arvioi oman opettajasi osuutta kokeilun toteuttamisen kannalta.

- Mitä olisit hänen toivonut tekevän enemmän (vähemmän) kokeilun kannalta? (englannin kielen suhteen; viestien tiedottamisen suhteen; tietokoneiden käytön suhteen...)

- Millä tavalla sait tietää saapuneista viesteistä? (monisteista; siirto-/piirtoheittimen kalvoista; suoraan tietokoneen kuvaruudusta?)

22. Millaiset työmuodot mielestäsi parhaiten sopisivat sähköpostikokeiluun vieraan kielen tunneilla? (esimerkiksi itsenäinen työprojekti, parityö, pienryhmätyö, opettajan johtama harjoitus...)

23. Miten suhtautuisit, jos koulusi tarjoaisi sinulle mahdollisuuden käyttää sähköpostia *itsenäisesti* ulkomaiseen kirjeenvaihtoon ensi lukuvuonna?

24. *Muita kommenttejasi!* Kirjoita tähän vapaasti niitä ajatuksiasi, jotka haluaisit minulle kertoa, mutta joihin ei edellisten kysymysten perusteella voinut ottaa kantaa.

Kiitokset jälleen siitä, että vastasit tunnollisesti!
Hyvää jatkoa!

THANKS!

Appendix D
Translation of the Second Finnish Students' Questionnaire

Senior Secondary School of XX, May/August 1990
QUESTIONNAIRE by Seppo Tella, University of Helsinki

Please fill in this questionnaire carefully. It helps me to best analyse the e-mail project and how you experienced it yourself. Circle the appropriate choice, or write a full answer to the question asked. You may continue your answer overleaf.

Family Name: _________ First Name: ________ (in block letters)

1. How much and for what purposes have you used *microcomputers* at school this spring?
In foreign language lessons—In other subjects? For what purposes?
2. How much have you used *word-processing* during the English lessons this spring?
3. Did you get enough instructions about how to use a *word-processor*? What kind of instructions would you have wished to have more?
4. What kind of difficulties have you had in using a word-processor? What kind of things should be emphasised more so that using a word-processor would be easier?
5. When writing an essay (a composition), which would you prefer if you could choose freely: working on a computer (word-processor) or with pen and paper?
6. Why do you prefer the micro / pen and paper?
7. How well can you type on a computer? How many fingers do you usually use when typing?
8. What did you write to be sent to England or to other countries?
9. Did you type any of your partners' contributions on the computer? If you did, what kind of things and under what circumstances?
10. How (much) did you plan your messages before you started writing them on a piece of paper or on a diskette?
- What kind of help material did you use when planning and writing (dictionaries, encyclopedia, grammar books, etc.)?
- What other material would you have wished to have at your disposal?
11. Your class received a certain number of letters from England amd several other countries. What interested you most in them?
12. In what way did you profit from the electronic link with a foreign school? Assess the following aspects and give some examples if possible.
Language in general (English; Finnish)—Music—Hobbies—Spending one's free time—Culture—Anything else?
13. In general, what do you think of the electronic link between your class and the English class now that the spring term is almost over?
14. What things would you have emphasised more in the electronic link between your class and the foreign students?

15. Tell me about your hobbies. What do you like doing after school (in the evenings, at weekends, in the holidays)?
16. What is your favourite school subject now? What was it at the upper level of the comprehensive school?
17. Name two of your best friends in your class. Why did you choose them?
18. If you worked in a group of three students for a longer time (e.g., exchanging e-mail letters with a foreign school once a week), which other two (from your class) would you choose to work with? On what grounds?
19. Imagine your class is making a trip to England or to the US as a guest of a foreign school. Which two students (from your class) would you choose to organise the trip?
20. From the Finnish point of view, the e-mail project was a success in some respects, but there was a lot to be changed for the better. How would you have wanted to change or modify the realisation of the project? Assess the following aspects at least.
- Computer laboratory in your school; access to using computers, etc.
- Number and quality of messages received from abroad
- Number and quality of messages sent abroad

21. Assess the role of your own teacher regarding the e-mail project.
- What do you think (s)he should have done more (less)? (informing of messages received; use of computers, giving background information, etc.)
- How did you know when there were messages from aborad? (you were given handouts; the teacher showed them on a datashow/OP system; you could read them directly on the computer screen...)

22. What kind of working practices do you believe are appropriate for e-mail in language learning? (e.g., pupil-to-pupil correspondence; autonomous work; longer projects; small group work; pairs work; exercises guided by the teacher...)
23. How would you react to the suggestion that you would be given a chance to use e-mail independently next term to exchange letters with a foreign school?
24. Any further comments? Please tell me freely any other ideas you find important for me to know.

Thank you very much for answering these questions conscientiously.

Have a nice summer!

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